

## LIST OF PUBLICATIONS

BY VALERY I. LEVITAS

### Monographs

- [1] Large Deformation of Materials with Complex Rheological Properties at Normal and High Pressure. **Levitas V.I.** New York, Nova Science Publishers, 1996.
- [2] Thermomechanics of Phase Transformations and Inelastic Deformations in Microinhomogeneous Materials. **Levitas V.I.** Kiev, Naukova Dumka, 1992 (In Russian).
- [3] Large Elastoplastic Deformations of Materials at High Pressure. **Levitas V.I.** Kiev, Naukova Dumka, 1987 (In Russian).

### Papers in Refereed Journals

2019

- [4] Imaging stress and magnetism at high pressures using a nanoscale quantum sensor. **Hsieh S., Bhattacharyya P., Zu C., Mittiga T., Smart T. J., Machado F., Kobrin B., Höhn T. O., Rui N. Z., Kamrani M., Chatterjee S., Choi S., Zaletel M., Struzhkin V. V., Moore J. E., Levitas V. I., Jeanloz R., Yao N. Y.** Science, 2019, accepted.
- [5] Fatigue-resistant high-performance elastocaloric materials via additive manufacturing. **Hou H., Simsek E., Ma T., Johnson N. S., Qian S., Cissé C., Stasak D., Hasan N. A., Zhou L., Hwang Y., Radermacher R., Levitas L. V., Kramer M. J., Zaeem M. A., Stebner A. P., Ott R. T., Cui J., Takeuchi I.** Science, 2019, Vol. 366, No. 6469, 1116-1121.
- [6] Highly Reactive Energetic Films by Pre-Stressing Nano-Aluminum Particles. **Bello M. N., Williams A. M., Levitas V.I., Tamura N., Unruh D. K., Warzywoda J., and Pantoya M. L.** Royal Society of Chemistry Advances, 2019, in press.
- [7] Phase field approach for nanoscale interaction between crack propagation and phase transformation. **Jafarzadeh H., Levitas V.I., Farrahic G. H., and Javanbakht M.** Nanoscale, 2019, Vol. 11, 22243-22247.
- [8] Tensorial stress-strain fields and large elastoplasticity as well as friction in diamond anvil cell up to 400 GPa. **Levitas V.I., Kamrani M., and Feng B.** NPJ Computational Materials, 2019, Vol. 5, 94, 11 pp.
- [9] Effect of 60° dislocation on transformation stresses, nucleation, and growth for phase transformations between silicon I and silicon II under triaxial loading: phase-field study. **Babaei H. and Levitas V.I.** Acta Materialia, 2019, Vol. 177, 178-186.
- [10] High-Pressure Phase Transformations under Severe Plastic Deformation by Torsion in Rotational Anvils. **Levitas V.I.** Material Transactions, 2019, Vol. 60, No. 7, 1294-1301, invited review.

- [11] Amorphization Induced by 60° Shuffle Dislocation Pileup against Tilt Grain Boundaries in Silicon Bicrystal under Shear. **Chen H., Levitas V.I., Xiong L.**, Acta Materialia, 2019, Vol. 179, 287-295.
- [12] Shear driven formation of nano-diamonds at sub-gigapascals and 300 K. **Gao Y., Ma Y., An Q., Levitas V. I., Zhang Y., Feng B., Chaudhuri J. and Goddard III W. A.** Carbon, 2019, Vol. 146, 364-368.
- [13] In-situ TEM analysis of the phase transformation mechanism of a Cu-Al-Ni shape memory alloy. **Kim T.-H., Ouyang G., Poplawsky J. D., Kramer M. J., Levitas V. I., Cui J., and Zhou L.** Journal of Alloys and Compounds, 2019, Vol. 808, 151743.
- [14] Algorithmic aspects and finite element solutions for advanced phase field approach to martensitic phase transformation under large strains. **Babaei H., Basak A., and Levitas V.I.**, Computational Mechanics, 2019, Vol. 64, 1177-1197.
- [15] Finite element procedure and simulations for a multiphase phase field approach to martensitic phase transformations at large strains and with interfacial stresses. **Basak A. and Levitas V.I.**, Computer Methods in Applied Mechanics and Engineering, 2019, Vol. 343, 368-406.
- [16] Kinetics of the  $\gamma$ - $\delta$  phase transition in energetic nitramine-octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine. **Bowlan P., Henson B. F., Smilowitz L., Levitas V. I., Suvorova N., and Oschwald D.** Journal of Chemical Physics, 2019, Vol. 159, No. 6, 064705.
- [17] Thermodynamic and kinetic analysis of the melt spinning process of Fe-6.5 wt.% Si alloy. **Cui S., Ouyang G., Ma T., Macziewski C. R., Levitas V. I., Zhou L., Kramer M. J., and Cui J.** Journal of Alloys and Compounds, 2019, Vol. 771, 643-648.
- [18] FEM modeling of plastic flow and strain-induced phase transformation in BN under high pressure and large shear in a rotational diamond anvil cell. **Feng B., Levitas V.I., and Li W.** International Journal of Plasticity, 2019, Vol. 113, 236-254.
- [19] Slip of Shuffle Screw Dislocations through Tilt Grain Boundaries in Silicon. **Chen H., Levitas V.I., Xiong L.**, Computational Materials Science, 2019, Vol. 1, 132-135.

## 2018

- [20] Scale-free modeling of coupled evolution of discrete dislocation bands and multivariant martensitic microstructure. **Levitas V.I., Esfahani S.E., and Ghamarian I.** Physical Review Letters, 2018, Vol. 121, 205701, 6 pages.
- [21] Lattice instability during solid-solid structural transformations under general applied stress tensor: example of Si I  $\rightarrow$  Si II with metallization. **Zarkevich N. A., Chen H., Levitas V.I., and Johnson D. D.** Physical Review Letters, 2018, Vol. 121, 165701, 6 pages. Supporting data: <https://doi.org/10.25380/iastate.7125368>.
- [22] Finite-element simulations of elastoplastic flow during compression of a sample in a diamond anvil cell under extremely high pressure: Effects of geometry and material properties. **Feng B. and Levitas V.I.** Physical Review Applied, 2018, Vol. 10, No.1, 064060, 12 pages.

- [23] Thermodynamically Consistent and Scale-Dependent Phase Field Approach for Crack Propagation Allowing for Surface Stresses. **Levitas V.I., Jafarzadeh H., Farrahic G. H., and Javanbakht M.** International Journal of Plasticity, 2018, Vol. 111, 1-35.
- [24] Impact Ignition and Combustion of Micron-Scale Aluminum Particles Pre-Stressed with Different Quenching Rates. **Hill K. J., Tamura N., Levitas V.I., and Pantoya M.L.** Journal of Applied Physics, 2018, Vol. 124, No. 11, 115903.
- [25] Phase field study of surface-induced melting and solidification from a nanovoid: effect of dimensionless width of void surface and void size. **Basak A. and Levitas V.I.**, Applied Physics Letters, 2018, Vol. 112, No. 20, 201602, 5 pages.
- [26] Coupled strain-induced alpha to omega phase transformation and plastic flow in zirconium under high pressure torsion in a rotational diamond anvil cell. **Feng B., Levitas V.I., and Kamrani M.** Materials Science and Engineering A, 2018, Vol. 731, 623-633.
- [27] Phase field approach for stress- and temperature-induced phase transformations that satisfies lattice instability conditions. Part 1. General theory. **Levitas V.I.** International Journal of Plasticity, 2018, Vol. 106, 164-185.
- [28] Phase field approach for stress- and temperature-induced phase transformations that satisfies lattice instability conditions. Part 2. Simulations of phase transformations Si I $\leftrightarrow$ Si II. **Babaei H. and Levitas V.I.** International Journal of Plasticity, 2018, Vol. 107, 223-245.
- [29] Nanoscale multiphase phase field approach for stress- and temperature-induced martensitic phase transformations with interfacial stresses at finite strains. **Basak A. and Levitas V.I.** Journal of the Mechanics and Physics of Solids, 2018, Vol. 113, 162-196.
- [30] Effect of the ratio of two nanosize parameters on the phase transformations. Viewpoint article. **Levitas V.I.** Scripta Materialia, 2018, Vol. 149C, 155-162.
- [31] Nanoscale mechanisms for high-pressure mechanochemistry: a phase field study. **Javanbakht M. and Levitas V.I.**, Journal of Materials Science, 2018, Vol. 53, No. 19, 13343-13363; invited paper for a special issue "Mechanochemical synthesis".
- [32] High pressure phase transformations revisited. Invited Viewpoint article. **Levitas V.I.** Journal of Physics: Condensed Matter, 2018, Vol. 30, No. 16, 163001, 15 pp. (invited topical review article for a special issue "Frontiers of High Pressure Science & Technologies: Emergent Matters & Phenomena").
- [33] Microscale Phase Field Modeling of the Martensitic Transformation During Cyclic Loading of NiTi Single Crystal. **Esfahani S.E., Ghamarian I., Levitas V.I., Collins P.C.** International Journal of Solids and Structures, 2018, Vol. 146, 80-96.

## 2017

- [34] FEM simulation of large deformation of copper in the quasi-constrained high-pressure-torsion setup. **Kamrani M., Levitas V.I., and Feng B.** Materials Science and Engineering A, 2017, Vol. 705, 219-230.

- [35] Lattice instability during phase transformations under multiaxial stress: modified transformation work criterion. **Levitas V.I., Chen H., and Xiong L.** Physical Review B, 2017, Vol. 96, No. 5, 054118, 11 pages.
- [36] Phase field approach to interaction between phase transformations and plasticity at the nanoscale at large strains. **Levitas V. I. and Javanbakht M.** Chebyshev's Proceedings (Chebyshevskii Sbornik), 2017, Vol. 18, No 3 (63), pp. 363-376. Invited paper into a volume in honor of Professor V.A. Levin.
- [37] Dropping the hammer: Examining impact ignition and combustion using pre-stressed aluminum powder. **Hill K. J., Warzywoda J., Pantoya M.L., and Levitas V.I.** Journal of Applied Physics, 2017, Vol. 122, 125102, 8 pages.
- [38] Elastic model for stress-tensor-induced martensitic transformation and lattice instability in silicon under large strains. **Levitas V.I.** Materials Research Letters, 2017, Vol. 5, No. 8, 554-561.
- [39] Interfacial stresses within boundary between martensitic variants: Analytical and numerical finite strain solutions for three phase field models. **Basak A. and Levitas V.I.** Acta Materialia, 2017, Vol. 139C, 174-187.
- [40] Coupled Elastoplasticity and Strain-Induced Phase Transformation under High Pressure and Large Strains: Formulation and Application to BN Sample Compressed in a Diamond Anvil Cell. **Feng B. and Levitas V.I.** International Journal of Plasticity, 2017, Vol. 96, 156-181.
- [41] Pressure self-focusing effect and novel methods for increasing the maximum pressure in traditional and rotational diamond anvil cells. **Feng B. and Levitas V.I.** Scientific Reports, 2017, Vol. 7, 45461, 10 pp.
- [42] Large elastoplastic deformation of a sample under compression and torsion in a rotational diamond anvil cell under megabar pressures. **Feng B. and Levitas V.I.** International Journal of Plasticity, 2017, Vol. 92, 79-95.
- [43] Triaxial-stress-induced homogeneous hysteresis-free first-order phase transformations with stable intermediate phases. **Levitas V.I., Chen H., and Xiong L.** Physical Review Letters, 2017, Vol. 118, 025701, 5 pp.
- [44] Plastic flows and strain-induced alpha to omega phase transformation in zirconium during compression in a diamond anvil cell: Finite element simulations. **Feng B. and Levitas V.I.** Materials Science and Engineering A, 2017, Vol. 680, 130-140.

## 2016

- [45] Phase field simulations of plastic strain-induced phase transformations under high pressure and large shear. **Javanbakht M. and Levitas V.I.** Physical Review B, 2016, Vol. 94, 214104, 21 pp.
- [46] Superheating and melting within aluminum core - oxide shell nanoparticle for a broad range of heating rates: Multiphysics phase field modeling. **Hwang Y.S. and Levitas V.I.** Physical Chemistry Chemical Physics, 2016, Vol. 18, 28835-28853.

- [47] Large elastoplasticity under static megabar pressures: formulation and application to compression of samples in diamond anvil cells. **Feng B., Levitas V.I., and Hemley R.J.** International Journal of Plasticity, 2016, Vol. 84, 33-57.
- [48] Stress relaxation in pre-stressed aluminum core-shell particles: x-ray diffraction study, modeling, and improved reactivity. **Levitas, V.I., McCollum, J., Pantoya, M.L., and Tamura N.** Combustion and Flame, 2016, Vol. 170, 30- 36.
- [49] Phase field approach with anisotropic interface energy and interface stresses: large strain formulation. **Levitas V.I. and Warren J. A.** Journal of the Mechanics and Physics of Solids, 2016, Vol. 91, 94-125.
- [50] Effects of the gasket on coupled plastic flow and strain-induced phase transformations under high pressure and large torsion in a rotational diamond anvil cell. **Feng B. and Levitas V.I.** Journal of Applied Physics, 2016, Vol. 119, No. 1, 015902, 12 pages.
- [51] Transformation-deformation bands in C<sub>60</sub> after the treatment in a shear diamond anvil cell. **Kulnitskiy, B.A., Blank V.D., Levitas V.I., Perezhagin I.A., Popov M.Yu., Kirichenko A.N., Tyukalova E.V.** Materials Research Express, 2016, Vol. 3, 045601, 8 pages.
- [52] Multiphase phase field theory for temperature-induced phase transformations: formulation and application to interfacial phases. **Levitas V.I. and Roy A.M.** Acta Materialia, 2016, Vol. 105, 244-257.
- [53] Phase-Field Approach to Nonequilibrium Phase Transformations in Elastic Solids via Intermediate Phase (Melt) Allowing for Interface Stresses. **Momeni K. and Levitas V.I.** Physical Chemistry Chemical Physics, 2016, Vol. 18, 12183-12203.
- [54] Phase field approach to dislocation evolution at large strains: Computational aspects. **Javanbakht M. and Levitas V.I.** International Journal of Solids and Structures, 2016, 82, 95-110.
- [55] Comment on "In situ imaging of ultra-fast loss of nanostructure in nanoparticle aggregates" [J. Appl. Phys. 115, 084903 (2014)]. **Levitas V.I. and Hwang Y.S.** Journal of Applied Physics, 2016, Vol. 119, 066103, 4 pages.

## 2015

- [56] Coupled phase field, heat conduction, and elastodynamic simulations of kinetic superheating and nanoscale melting of aluminum nanolayer irradiated by picosecond laser. **Hwang Y.S. and Levitas V.I.** Physical Chemistry Chemical Physics, 2015, Vol. 17, 31758-31768.
- [57] Thermodynamically consistent phase field theory of phase transformations with anisotropic interface energies and stresses. **Levitas V.I. and Warren J. A.** Physical Review B, 2015, Vol. 92, No. 14, 144106, 16 pages.
- [58] Thermodynamically consistent phase field approach to dislocation evolution at small and large strains. **Levitas V.I. and Javanbakht M.** Journal of the Mechanics and Physics of Solids, 2015, Vol. 82, 345-366.

- [59] A Phase-Field Approach to Solid-Solid Phase Transformations via Intermediate Interfacial Phases under Stress Tensor. **Momeni K. and Levitas V.I.** International Journal of Solids and Structures, 2015, Vol. 71, 39-56.
- [60] Internal Stresses in Pre-Stressed Micron-Scale Aluminum Core-Shell Particles and Their Improved Reactivity. **Levitas, V.I., McCollum, J., Pantoya, M.L., and Tamura N.** Journal of Applied Physics, 2015, Vol. 118, No. 9, 094305.
- [61] Interaction between phase transformations and dislocations at the nanoscale. Part 1. General phase field approach. **Levitas V.I. and Javanbakht M.** Journal of the Mechanics and Physics of Solids, 2015, Vol. 82, 287-319.
- [62] Interaction between phase transformations and dislocations at the nanoscale. Part 2. Phase field simulation examples. **Javanbakht M. and Levitas V.I.** Journal of the Mechanics and Physics of Solids, 2015, Vol. 82, 164-185.
- [63] Multiphase phase field theory for temperature- and stress-induced phase transformations. **Levitas V.I. and Roy A.M.** Physical Review B, 2015, Vol. 91, No.17, 174109, 7 pages.
- [64] The strong influence of internal stresses on the nucleation of a nanosized, deeply undercooled melt at a solid-solid interface. **Momeni K., Levitas V.I., and Warren J.A.** Nano Letters, 2015, Vol. 15, No. 4, 2298-2303.
- [65] Interaction of phase transformations and plasticity at the nanoscale: phase field approach. **Levitas V.I. and Javanbakht M.** Materials Today: Proceedings 2S, 2015, S493-S498.
- [66] New Automated Shear Cell with Diamond Anvils for in situ Studies of Materials Using X-ray Diffraction. **Novikov N.V., Shvedov L.K., Krivosheya Yu. N., Levitas, V.I.** Journal of Superhard Materials, 2015, Vol. 37, No. 1, 1-7.
- [67] Pre-Stressing Micron-Scale Aluminum Core-Shell Particles to Improve Reactivity. **Levitas, V.I., McCollum, J. and Pantoya, M.L.** Scientific Reports, 2015, Vol. 5, 7879, 6 pages.
- [68] Prediction of the Mechanical Erosion Rate Decrement for Carbon-Composite Nozzle by using the Nano-Size Additive Aluminum Particle. **Tarey, P., Kim J., Levitas, V. I., Ha D., Park J. H., and Yang H.** Journal of the Korean Society of Propulsion Engineers, 2015, Vol. 19, No. 6, 42-53.
- [69] Molecular Level Understanding of Chemical Erosion on Graphite Surface using Molecular Dynamics Simulations. **Murugesan, R., Park K, Levitas, V. I., Yang H., Park J. H., and Ha D.** Journal of the Korean Society of Propulsion Engineers, 2015, Vol. 19, No. 6, 54-63.

#### 2014

- [70] Phase field approach to martensitic phase transformations with large strains and interface stresses. **Levitas V.I.** Journal of the Mechanics and Physics of Solids, 2014, Vol. 70, 154-189.
- [71] Internal stress-induced melting below melting temperature at high-rate laser heating. **Hwang Y.S. and Levitas V.I.** Applied Physics Letters, 2014, Vol. 104, 263106, 4 pages.

- [72] Anisotropic compositional expansion in elastoplastic materials and corresponding chemical potential: Large-strain formulation and application to amorphous lithiated silicon. **Levitas V.I. and Attariani H.** Journal of the Mechanics and Physics of Solids, 2014, Vol. 69, pp. 84-111.
- [73] Propagating phase interface with intermediate interfacial phase: Phase field approach. **Momeni K. and Levitas V.I.** Physical Review B, 2014, Vol. 89, No.18, 184102, 24 pages.
- [74] Strain-induced phase transformation under compression in a diamond anvil cell: simulations of a sample and gasket. **Feng B., Levitas V.I., Ma Y.** Journal of Applied Physics, 2014, Vol. 115, 163509, 14 pages.
- [75] Unambiguous Gibbs dividing surface for nonequilibrium finite-width interface: Static equivalence approach. **Levitas V.I.** Physical Review B, 2014, Vol. 89, 094107, 5 pages.
- [76] Melting and solidification of nanoparticles: Scale effects, thermally activated surface nucleation, and bistable states. **Levitas V.I. and Samani K.** Physical Review B, 2014, Vol. 89, 075427, 10 pages.
- [77] Phase transformations in nanograin materials under high pressure and plastic shear: nanoscale mechanisms. **Levitas V.I. and Javanbakht M.** Nanoscale, 2014, Vol. 6, No 1, 162 - 166.
- [78] Solid-Solid Transformations via Nanoscale Intermediate Interfacial Phase: Multiple Structures, Scale and Mechanics Effects. **Levitas V.I. and Momeni K.** Acta Materialia, 2014, Vol. 65, 125-132.
- [79] Melt Dispersion Mechanism for Fast Reaction of Aluminum Nano- and Micron-scale Particles: Flame Propagation and SEM Studies. **Levitas V.I., Pantoya M.L., and Dean S.** Combustion and Flame, 2014, Vol. 161, No. 6, 1668-1677.
- [80] Strain-induced phase transformations under high pressure and large shear in a rotational diamond anvil cell: Simulation of loading, unloading, and reloading. **Feng B., Levitas V.I., Zarechnyy O.** Computational Materials Science, 2014, Vol. 84, 404-416.
- [81] A Mechanistic Perspective of Atmospheric Oxygen Sensitivity on Composite Energetic Material Reactions. **Farley C., Pantoya M.L., Levitas V.I.** Combustion and Flame, 2014, Vol. 161, No. 4, 1131-1134.

### 2013

- [82] Phase field simulation of kinetic superheating and melting of aluminum nanolayer irradiated by pico- and femtosecond laser. **Hwang Y.S. and Levitas V.I.** Applied Physics Letters, 2013, Vol. 103, No. 26, 263107.
- [83] Coupled phase transformations and plastic flows under torsion at high pressure in rotational diamond anvil cell: Effect of contact sliding. **Feng B. and Levitas V.I.** Journal of Applied Physics, 2013, Vol. 114, No. 21, 213514, 12 pages.
- [84] Multiple twinning and variant-variant transformations in martensite: Phase-field approach. **Levitas V.I., Roy A.M., and Preston D. L.** Physical Review B, 2013, Vol. 88, 054113, 8 pages.
- [85] Phase field approach to interaction of phase transformation and dislocation evolution. **Levitas V.I. and Javanbakht M.** Applied Physics Letters, 2013, Vol. 102, 251904, 4 pages.

- [86] Plastic flows and phase transformations in materials under compression in diamond anvil cell: Effect of contact sliding. **Feng B., Levitas V.I., and Zarechnyy O. M.** Journal of Applied Physics, 2013, Vol. 114, 043506, 12 pages.
- [87] Thermodynamically consistent phase field approach to phase transformations with interface stresses. **Levitas V.I.** Acta Materialia, 2013, Vol. 61, 4305-4319.
- [88] Phase-field simulation of stress-induced martensitic phase transformations at large strains. **Levin V. A., Levitas V. I., Zingerman K.M., Freiman E.I.** International Journal of Solids and Structures, 2013, Vol. 50, 2914-2928.
- [89] Anisotropic Compositional Expansion and Chemical Potential for Amorphous Lithiated Silicon under Stress Tensor. **Levitas V.I. and Attariani H.** Scientific Reports, 2013, Vol. 3, 1615, 5 pages.
- [90] Phase-field theory for martensitic phase transformations at large strains. **Levitas V.I.** International Journal of Plasticity, 2013, Vol. 49, 85-118.
- [91] Interface Stresses for Nonequilibrium Microstructures in Phase Field Approach: Exact Analytical Results. **Levitas V.I.** Physical Review B, 2013, Vol. 87, 054112, 5 pages.
- [92] Strain-induced phase transformations under compression, unloading, and reloading in a diamond anvil cell. **Feng B., Zarechnyy O. M., and Levitas V.I.** Journal of Applied Physics, 2013, Vol. 113, 173514, 9 pages.
- [93] Mechanochemical Mechanism for Reaction of Aluminum Nano- and Micron-scale Particles. **Levitas V.I.** Philosophical Transactions of the Royal Society A, 2013, Vol. 371, 20120215, 14 pages.

## 2012

- [94] Shear-Induced Phase Transition of Nanocrystalline Hexagonal Boron Nitride to Wurtzitic Structure at Room Temperature and Low Pressure. **Ji C., Levitas V. I., Zhu H., Chaudhuri J., Marathe A., Ma Y.** Proceedings of the National Academy of Sciences of the United States of America, 2012, Vol. 109, No. 47, 19108-19112.
- [95] Advanced phase field approach to dislocation evolution. **Levitas V.I. and Javanbakht M.** Physical Review B, Rapid Communication, 2012, Vol. 86, 140101(R), 5 pages.
- [96] Virtual Melting as a New Mechanism of Stress Relaxation Under High Strain Rate Loading. **Levitas V.I. and Ravelo R.** Proceedings of the National Academy of Sciences of the United States of America, 2012, Vol. 109, No. 33, 13204-13207. <sup>1</sup>
- [97] Crystal-crystal phase transformation via surface-induced virtual pre-melting. **Levitas V.I., Ren Z., Zeng Y., Zhang Z., and Han G.** Physical Review B, Rapid Communication, 2012, Vol. 85, No. 22, 220104(R), 5 pages.

---

<sup>1</sup>Featured in: P. Ball. Shock relief. Nature Materials, 2012, Vol. 11, p. 747; S.M. Dambrot. Crystals take a chill pill: A thermomechanical theory of low-temperature melting. August 21, 2012 <http://phys.org/news/2012-08-crystals-chill-pill-thermomechanical-theory.html>.



- [98] Effect of Oxide Shell Growth on Nano-Aluminum Thermite Propagation Rates. **Gesner J., Pantoya M.L., and Levitas V.I.** *Combustion and Flame*, 2012, Vol. 159, No. 11, 3448-3453.
- [99] Reply to Comment on "Mechanochemical Continuum Modeling of Nanovoid Nucleation and Growth in Reacting Nanoparticles." **Levitas V.I. and Attariani H.** *Journal of Physical Chemistry C*, 2012, Vol. 116, 12991-12993.
- [100] High-density amorphous phase of silicon carbide obtained under large plastic shear and high pressure. **Levitas V.I., Ma Y., Selvi E., Wu J., and Patten J.A.** *Physical Review B*, 2012, Vol. 85, No.5, 054114, 5 pages.
- [101] Sublimation, chemical decomposition, and melting inside an elastoplastic material: General continuum thermodynamic and kinetic theory. **Levitas V.I.** *International Journal of Plasticity*, 2012, Vol. 34, pp. 41-60.
- [102] Thermodynamics and kinetics of nucleation of a spherical gas bubble inside an elastoplastic material due to sublimation. **Levitas V.I. and Altukhova N.** *International Journal of Plasticity*, 2012, Vol. 34, pp. 12-40.
- [103] Finite element simulations of dynamics of multivariant martensitic phase transitions based on Ginzburg-Landau theory. **Cho J.-Y., Idesman A. V., Levitas V. I., and Park T.** *International Journal of Solids and Structures*, 2012, Vol. 49, 1973-1992.
- [104] Mechanochemical Continuum Modeling of Nanovoid Nucleation and Growth in Reacting Nanoparticles. **Levitas V.I. and Attariani H.** *Journal of Physical Chemistry C*, 2012, Vol. 116, No. 1, 54-62.
- [105] Coupled plastic flow and phase transformation under compression of materials in a diamond anvil cell: Effects of transformation kinetics and yield strength. **Zarechnyy O. M., Levitas V.I., and Ma Y.** *Journal of Applied Physics*, 2012, Vol. 111, 023518, 5 pages.

## 2011

- [106] Surface-induced phase transformations: Multiple scale and mechanics effects and morphological transitions. **Levitas V.I. and Javanbakht M.** *Physical Review Letters*, 2011, Vol. 107, 175701, 5 pages (with online movies).
- [107] Coherent solid-liquid interface with stress relaxation in a phase-field approach to the melting/solidification transition. **Levitas V.I. and Samani K.** *Physical Review B, Rapid Communication*, 2011, Vol. 84, No. 14, 140103(R), 4 pages.
- [108] Size and mechanics effects in surface-induced melting of nanoparticles. **Levitas V.I. and Samani K.** *Nature Communications*, 2011, Vol. 2, 284, 6 pages.
- [109] Thermodynamics and kinetics of nanovoid nucleation inside elastoplastic material. **Levitas V.I. and Altukhova N.** *Acta Materialia*, 2011, Vol. 59, 7051-7059.
- [110] Phase-field modeling of fracture in liquid. **Levitas V.I., Idesman A.V., and Palakala A.** *J. Applied Physics*, 2011, Vol. 110, No. 3, 033531, 9 pages; selected and published by the *Virtual Journal of Nanoscale Science & Technology*, August 22, 2011 issue.

- [111] Phase Transition and Structure of Silver Azide at High Pressure. **Hou D., Zhang F., Ji C., Hannon T., Zhu H., Wu Z., Levitas V.I., and Ma Y.** J. Applied Physics, 2011, Vol. 110, 023524, 6 pages.
- [112] Phase-field approach to martensitic phase transformations: Effect of martensite-martensite interface energy. **Levitas V.I. and Javanbakht M.** International Journal of Materials Research, 2011, Vol. 102, No. 6, 652-665.
- [113] Toward Design of the Pre-stressed Nano- and Microscale Aluminum Particles Covered by Oxide Shell. **Levitas V.I., Dikici B., and Pantoya M.L.** Combustion and Flame, 2011, Vol. 158, 1413-1417.
- [114] High pressure X-ray diffraction study of potassium azide. **Ji C., Zhang F., Hou D., Zhu H., Wu J., Chyu M.-C., Levitas V.I., and Ma Y.** J. Physics and Chemistry Solids, 2011, Vol. 72, No. 6, 736-739.

### 2010

- [115] Surface tension and energy in multivariant martensitic transformations: Phase-field theory, simulations, and model of coherent interface. **Levitas V.I. and Javanbakht M.** Physical Review Letters, 2010, Vol. 105, No.16, 165701, 4 pages (with online movies).
- [116] Modeling and simulation of strain-induced phase transformations under compression and torsion in a rotational diamond anvil cell. **Levitas V.I. and Zarechnyy O.** Physical Review B, 2010, Vol. 82, 174124, 15 pages.
- [117] Modeling and simulation of strain-induced phase transformations under compression in a diamond anvil cell. **Levitas V.I. and Zarechnyy O.** Physical Review B, 2010, Vol. 82, 174123, 12 pages.
- [118] Displacive phase transitions at large strains: Phase-field theory and simulations. **Levin V. A., Levitas V. I., Lokhin V.V., Zingerman K.M., Sayakhova L.F., Freiman E.I.,** Doklady Physics, 2010, Vol. 55, No. 10, pp. 507-511.
- [119] Numerical study of stress and plastic strain evolution under compression and shear of a sample in rotational anvil cell. **Levitas V.I. and Zarechnyy O.** High Pressure Research, 2010, Vol. 30, No. 4, 653-669.
- [120] The Effect of Pre-heating on Flame Propagation in Nanocomposite Thermites. **Dikici B., Pantoya M.L., and Levitas V.I.** Combustion and Flame, 2010, Vol. 157, 1581 - 1585.
- [121] Interface propagation and microstructure evolution in phase field models of stress-induced martensitic phase transformations. **Levitas V.I., Lee D.-W. and Preston D.L.** International J. Plasticity, 2010, Vol. 26, No. 3, 395-422.

### 2009

- [122] HMX polymorphism: virtual melting growth mechanism, cluster-to-cluster nucleation mechanism and physically based kinetics. **V. I. Levitas, L. B. Smilowitz, B. F. Henson, and B. W. Asay.** International Journal of Energetic Materials and Chemical Propulsion, 2009, Vol. 8, No. 6, 571-593.

- [123] Modeling and simulation of mechanochemical processes in rotational diamond anvil cell. **Levitas V.I. and Zarechnyy O.M.** Europhysics Letters, 2009, Vol. 88, 16004, 1-6.
- [124] Displacive phase transitions at large strains: Phase-field theory and simulations. **Levitas V. I., Levin V. A., Zingerman K. M., and Freiman E. I.**, Physical Review Letters, 2009, Vol. 103, No. 2, 025702, 4 pages; selected and published by the Virtual Journal of Nanoscale Science & Technology, July 20, 2009 issue.
- [125] Effect of the alumina shell on the melting temperature depression for nano-aluminum particles. **Levitas V. I., Pantoya M., Chauhan G., and Rivero I.**, Journal of Physical Chemistry C, 2009, Vol. 113, No. 32, 14088-14096.
- [126] Influence of Aluminum Passivation on the Reaction Mechanism: Flame Propagation Studies. **Dikici B., Dean S.W., Pantoya M.L., Levitas V.I. and Jouet R.J.** Energy and Fuels, 2009, Vol. 23, 4231-4235.
- [127] Sublimation via virtual melting inside an elastoplastic material. **Levitas V.I. and Altukhova N.** Physical Review B, 2009, Vol. 79, No. 21, 212101, 4 pages; selected and published by the Virtual Journal of Nanoscale Science & Technology, June 29, 2009 issue.
- [128] The effect of bulk density on the reaction dynamics of nano and micron particulate thermites. **Pantoya M., Levitas V. I., Granier J. J., and Henderson J. B. J.** Propulsion and Power, 2009, Vol. 25, No. 2, 465-470.
- [129] Burn Time of Aluminum Nanoparticles: Strong Effect of the Heating Rate and Melt Dispersion Mechanism. **Levitas V. I.** Combustion and Flame, 2009, Vol. 156, No. 2, 543-546.
- [130] Micromechanical modeling of stress-induced phase transformations. Part 1. Thermodynamics and kinetics of coupled interface propagation and reorientation. **Levitas V.I. and Ozsoy I. B.** Int. J. Plasticity, 2009, Vol. 25, No. 2, 239-280.
- [131] Micromechanical modeling of stress-induced phase transformations. Part 2. Computational algorithms and examples. **Levitas V.I. and Ozsoy I. B.** Int. J. Plasticity, 2009, Vol. 25, No. 3, 546-583.
- [132] Mechanochemical mechanism for fast reaction of metastable intermolecular composites based on dispersion of liquid metal (**Invited paper**). **V. I. Levitas and M. L. Pantoya.** International Journal of Energetic Materials and Chemical Propulsion, 2009, Vol. 7, No. 1, 17-38.

## 2008

- [133] Fast Reactions with Nano and Micron Aluminum: A Study on Oxidation versus Fluorination. **Watson K. W., Pantoya M. and Levitas V. I.** Combustion and Flame, 2008, Vol. 155, 619-634.
- [134] Sublimation inside elastoplastic material. **Levitas V.I. and Altukhova N.** Physical Review Letters, 2008, Vol. 101, No.14, 145703, 4 pages.
- [135] Finite element modeling of dynamics of martensitic phase transitions. **Idesman A. V., Cho J.-Y. and Levitas V. I.** Applied Physics Letters, Vol. 93, 043102, 2008, 3 pages.

- [136] Melt dispersion mechanism for fast reaction of aluminum particles: extension for micron scale particles and fluorination. **Levitas V.I., Pantoya M. and Watson K. W.** Applied Physics Letters, 2008, Vol. 92, 201917, 3 pages; selected and published by the Virtual Journal of Nanoscale Science & Technology, June 9, 2008 issue.
- [137] Melt-dispersion versus diffusive oxidation mechanism for aluminum nanoparticles: critical experiments and controlling parameters. **Levitas V.I., Pantoya M. and Dikici B.** Applied Physics Letters, 2008, Vol. 92, No. 1, 011921, 3 pages.

## 2007

- [138] Athermal resistance to an interface motion in phase field theory of microstructure evolution. **Levitas V.I. and Lee D-W.** Physical Review Letters, 2007, Vol. 99, 245701, 4 pages.
- [139] Coupled phase transformation, chemical decomposition, and deformation in plastic-bonded explosive: Simulations. **Levitas, V. I., Henson, B. F., Smilowitz, L. B, Zerkle, D. K., and Asay, B. W.,** J. Appl. Physics, 2007, Vol. 102, No. 11, 113520 (1-10).
- [140] Coupled phase transformation, chemical decomposition, and deformation in plastic-bonded explosive: Models. **Levitas, V. I., Henson, B. F., Smilowitz, L. B, Zerkle, D. K. and Asay, B. W.,** J. Appl. Physics, 2007 Vol. 102, No. 11, 113502 (1-14); selected and published by the Virtual Journal of Nanoscale Science & Technology, 2007, December 17 issue.
- [141] Plastic flow under compression and shear in rotational diamond anvil cell: Finite - element study. **Levitas V. I. and Zarechnyy O. M.** Applied Physics Letters, 2007, Vol.91, No.14, 141919, 3 pages.
- [142] Interface reorientation during coherent phase transformations. **Levitas V.I., Ozsoy I. B. and Preston D.L.** Europhysics Letters, 78, 16003 (2007), 5 pages.
- [143] Mechanochemical Mechanism for Fast Reaction of Metastable Intermolecular Composites Based on Dispersion of Liquid Metal. **Levitas V. I., Asay B. W., Son S. F. and Pantoya M.** J. Applied Physics, 2007, Vol. 101, 083524 (1-20).

## 2006

- [144] Nucleation mechanism for reconstructive solid-solid phase transitions via melt mediated nano-cluster transformation. **Levitas V. I., Smilowitz L. B, Henson B. F., and Asay B. W.** Applied Physics Letters, 2006, Vol. 89, 231930, 3 pages.
- [145] Kinetics of strain-induced structural changes under high pressure. **Levitas V. I. and Zarechnyy O. M.** J. Physical Chemistry B, 2006, Vol. 110, 16035-16046.
- [146] Melt Dispersion Mechanism for Fast Reaction of Nanothermites. **Levitas V. I., Asay B. W., Son S. F. and Pantoya M.** Applied Physics Letters, 2006, Vol. 89, No. 7, 071909, 3 pages; selected and published by the Virtual Journal of Nanoscale Science & Technology, 2006, August 28 issue.
- [147] Solid-solid phase transformation via internal stress-induced virtual melting, significantly below the melting temperature. Application to HMX energetic crystal. **Levitas V. I., Henson B. F., Smilowitz L. B, and Asay B. W.** J. Physical Chemistry B, 2006, Vol. 110, No. 20, 10105-10119.

- [148] Strain-induced disorder, phase transformations and transformation induced plasticity in hexagonal boron nitride under compression and shear in a rotational diamond anvil cell: in-situ X-ray diffraction study and modeling. **Levitas V. I., Ma Y., Hashemi J., Holtz M., and Guven N.** Journal of Chemical Physics, 2006, Vol. 125, 044507, pp. 1-14.
- [149] X-ray diffraction measurements in a rotational diamond anvil cell. **Ma Y. Z., Levitas, V., and Hashemi, J.** J. of Physics and Chemistry of Solids, 2006, Vol. 67, pp. 2083-2090.
- [150] Effect of shear strain on the  $\alpha - \epsilon$  phase transition of iron: a new approach in the rotational diamond anvil cell, **Ma Y., Selvi E., Levitas V.I. and Hashemi J.** J. Phys.: Cond. Matt., 2006, Vol. 18, 1075-1082.
- [151] Interfacial and volumetric kinetics of the  $\beta \rightarrow \delta$  phase transition in the energetic nitramine octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine based on the virtual melting mechanism. **Levitas V. I., Smilowitz L. B., Henson B. F., L. B, and Asay B. W.** Journal of Chemical Physics, 2006, Vol. 124, 026101, 4 pages.

## 2005

- [152] Solid-solid phase transformation via internal stress-induced virtual melting: additional confirmations. **Levitas V. I., Henson B. F., Smilowitz L. B., and Asay B. W.** Applied Physics Letters, 2005, Vol. 87, No. 1, 191907, 3 pages.
- [153] Crystal-amorphous and crystal-crystal phase transformations via virtual melting. **Levitas V.I.** Phys. Review Letters, 2005, Vol. 95, No. 7, 075701, 4 pages.
- [154] Thermomechanical lattice instability and phase field theory of martensitic phase transformations, twinning and dislocations at large strains. **Levitas V.I., Preston D.L.** Physics Letters A, 2005, Vol. 343, 32-39.
- [155] Transformation-induced plasticity and cascading structural changes in hexagonal boron nitride under high pressure and shear. **Levitas, V. I., Ma, Y. Z., and Hashemi, J.** Appl. Phys. Lett., Vol. 86 (2005), 071912, 3 pages.
- [156] Finite Element Simulations of Martensitic Phase Transitions and Microstructure Based on Strain Softening Model. **Idesman A.V., Levitas V.I., Preston D.L., and Cho J.-Y.** J. Mechanics and Physics of Solids, 2005, Vol. 53, No. 3, pp. 495-523.

## 2004

- [157] High Pressure Mechanochemistry: Conceptual Multiscale Theory and Interpretation of Experiments. **Levitas V. I.** Phys. Review B, 2004, Vol. 70, No. 18, 184118, 1-24; selected and published by the Virtual Journal of Nanoscale Science & Technology, 2004, December 6 issue.
- [158] Strain-induced disorder and phase transformation in hexagonal boron nitride under quasi-homogeneous pressure: in-situ X-ray study in a rotational diamond anvil cell. **Levitas, V. I., Hashemi, J., and Ma, Y.** Europhysics Letters, 2004, Vol. 68, No. 4, 550-556.

- [159] Microscale simulation of martensitic microstructure evolution. **Levitas V. I., Idesman A.V. and Preston D.L.** Phys. Review Letters, 2004, Vol. 93, No. 10, 105701, 4 pages; selected and published by the Virtual Journal of Nanoscale Science & Technology, 2004, September 5 issue.
- [160] Solid-solid phase transformation via virtual melt, significantly below the melting temperature. **Levitas V. I., Henson B. F., Smilowitz L. B., and Asay B. W.** Phys. Review Letters, 2004, Vol. 92, No. 23, 235702, 4 pages; selected and published by the Virtual Journal of Nanoscale Science & Technology, 2004, June 21 issue.
- [161] A microscale model for strain-induced phase transformations and chemical reactions under high pressure. **Levitas V.I.** Europhysics Letters, 2004, Vol. 66, No. 5, 687-693.
- [162] Strain-induced nucleation at a dislocation pile-up: a nanoscale model for high pressure mechanochemistry. **Levitas V.I.** Phys. Letters A, 2004, Vol. 327, 180-185.

### 2003

- [163] Three-dimensional Landau theory for multivariant stress-induced martensitic phase transformations. Part III. Alternative potentials, critical nuclei, kink solutions, and dislocation theory. **Levitas V.I., Preston D.L. and Lee D.-W.** Phys. Review B, 2003, Vol. 68, 134201 (1-24).

### 2002

- [164] Three-dimensional Landau theory for multivariant stress-induced martensitic phase transformations. Part I. Austenite  $\leftrightarrow$  martensite. **Levitas V.I., Preston D.L.** Phys. Review B, 2002, Vol. 66, 134206(1-9).
- [165] Three-dimensional Landau theory for multivariant stress-induced martensitic phase transformations. Part II. Multivariant phase transformations and stress space analysis. **Levitas V.I., Preston D. L.** Phys. Review. B, 2002, Vol. 66, 134207(1-15).
- [166] Critical Thought Experiment to Choose the Driving Force for Interface Propagation in Inelastic Materials. **Levitas V.I.** Int. J. Plasticity, 2002, Vol. 18, pp. 1499-1525.
- [167] Low Pressure Phase Transformation from Rhombohedral to Cubic BN: Experiment and Theory. **Levitas V.I. and Shvedov L.K.** Physical Review B, 2002, Vol. 65, No. 10, 104109 (1-6).
- [168] Numerical Modeling of Martensite Growth in Elastoplastic Material. **Levitas V.I., Idesman A.V., Olson G.B. and Stein E.** Philosophical Magazine, A, 2002, Vol. 82, No. 3, 429-462.
- [169] Thermomechanical Model of Phase Transformation Graphite to Diamond. **Leshchuk A. A., Novikov N. V., Levitas V. I.** J. of Superhard Materials, 2002, No. 1, pp. 49-57.
- [170] A Variational Formulation of Rate-Independent Phase Transformations Using an Extremum Principle. **Mielke A., Theil F., Levitas V.I.** Archive for Rational Mechanics and Analysis, 2002, Vol. 162, 137-177. **Essential Science Indicator: Emerging Research Frontiers Paper in Mathematics in August 2006**; [http://esi-topics.com/erf/2006/august06-Mielke\\_Theil\\_Levitas.html](http://esi-topics.com/erf/2006/august06-Mielke_Theil_Levitas.html)

## 2001

- [171] Computer Simulation of Physical and Mechanical Processes Running in the Reaction Cells of High-Pressure Installations in the Course of Synthesis of Diamonds. **Leshchuk A. A., Novikov N. V., Levitas V. I.** Strength of Materials, 2001, Vol.33, No. 3, pp. 277-292.

## 2000

- [172] Structural Changes without Stable Intermediate State in Inelastic Material. Part II. Applications to Displacive and Diffusional-Displacive Phase Transformations, Strain-Induced Chemical Reactions and Ductile Fracture. **Levitas V.I.** Int. J. Plasticity, 2000, Vol. 16, No. 7-8, pp. 851-892.
- [173] Structural Changes without Stable Intermediate State in Inelastic Material. Part I. General Thermomechanical and Kinetic Approaches. **Levitas V.I.** Int. J. Plasticity, 2000, Vol. 16, No. 7-8, pp. 805-849.
- [174] Structural Changes in Elastoplastic Materials: a Unified Finite Element Approach for Phase Transformation, Twinning and Fracture. **Idesman A.V., Levitas V.I., Stein E.** Int. J. Plasticity, 2000, Vol. 16, No. 7-8, pp. 893-949.
- [175] Thermomechanical and Kinetic Approaches to Diffusional-Displacive Phase Transitions in Inelastic Materials. **Levitas V.I.** Mech. Res. Commun., 2000, Vol. 27, No. 2, pp. 217-227.
- [176] A Study of a Hamiltonian Model for Phase Transformations Including Microkinetic Energy. **Theil F., Levitas V.I.** Mathematics and Mechanics of Solids, 2000, Vol. 5, No.3, pp. 337-368.
- [177] Finite-Element Analysis of Appearance and Growth of a Martensitic Plate in an Austenitic Matrix. **Idesman A.I., Levitas V.I., Stein E.** ZAMM, 2000, Vol. 80, pp. 189-192.

## 1999

- [178] Shape Memory Alloys: Micromechanical Modeling and Numerical Analysis of Structures. **Levitas V.I., Idesman A.V., Stein E.** J. Intelligent Material System and Structures, 1999, Vol. 10, No. 12, pp. 983-996.
- [179] Elastoplastic Materials with Martensitic Phase Transition and Twinning at Finite Strains: Numerical Solution with the Finite Element Method. **Idesman A.V., Levitas V.I., Stein E.** Comp. Meth. in Appl. Mech. and Eng., 1999, Vol. 173, No. 1-2, pp. 71-98.
- [180] Regularities of Phase Transformations and Plastic Straining of Materials in Compression and Shear in Diamond Anvils: Experiments and Theory. **Novikov N.V., Polotnyak S.B., Shvedov L.K., Levitas, V.I.** J. of Superhard Materials, 1999, Vol. 21, No. 3, pp. 36-48.

## 1998

- [181] Continuum Modeling of Strain-Induced Martensitic Transformation at Shear-Band Intersections. **Levitas V.I., Idesman A.V., Olson G.B.** Acta Materialia, 1998, Vol. 47, No. 1, pp. 219-233.

- [182] A Simple Micromechanical Model for Pseudoelastic Behavior of *CuZnAl* Alloy. **Levitas V.I., Idesman A.V., Stein E., Spielfeld J., Hornbogen E.** J. Intelligent Material System and Structures, 1998, Vol. 9, No. 5, pp. 324-334.
- [183] Strain-Induced Structural Changes and Chemical Reactions. II. Modeling of Reactions in Shear Band. **Levitas V.I., Nesterenko V.F., Meyers M.A.** Acta Materialia, 1998, Vol. 46, No. 16, pp. 5947-5963.
- [184] Strain-Induced Structural Changes and Chemical Reactions. I. Thermomechanical and Kinetic Models. **Levitas V.I., Nesterenko V.F., Meyers M.A.** Acta Materialia, 1998, Vol. 46, No. 16, pp. 5929-5945.
- [185] Thermomechanics and Kinetics of Generalized Second-Order Phase Transitions in Inelastic Materials. Application to Ductile Fracture. **Levitas V.I.** Mech. Res. Commun., 1998, Vol. 25, No. 4, pp. 427-436.
- [186] A New Look at the Problem of Plastic Spin Based on Stability Analysis. **Levitas V.I.** J. Mech. Phys. Solids, 1998, Vol. 46, No. 3, pp. 557-590.
- [187] Phase Transition in a Plastic Layer: Finite Strains Analytical Solution. **Levitas V.I.** ZAMM, 1998, Vol. 78, supplément 1, pp. S117-S120.
- [188] Finite Element Simulation of Martensitic Phase Transitions in Elastoplastic Materials. **Levitas V.I., Idesman A.V., Stein E.** Int. J. Solids and Structures, 1998, Vol. 35, No. 9-10, pp. 855-887.
- [189] Thermomechanical Theory of Martensitic Phase Transformations in Inelastic Materials. **Levitas V.I.** Int. J. Solids and Structures, 1998, Vol. 35, No. 9-10, pp. 889-940.

### 1997

- [190] Principle of Minimum Dissipation Rate at Time  $t + \Delta t$  for the Plastic Spin. **Levitas V.I.** Mech. Res. Commun., 1997, Vol. 24, No. 6, pp. 639-648.
- [191] Phase Transitions in Elastoplastic Materials: Continuum Thermomechanical Theory and Examples of Control. Part II. **Levitas V.I.** J. Mech. Phys. Solids, 1997, Vol. 45, No. 7, pp. 1203-1222.
- [192] Phase Transitions in Elastoplastic Materials: Continuum Thermomechanical Theory and Examples of Control. Part I. **Levitas V.I.** J. Mech. Phys. Solids, 1997, Vol. 45, No. 6, pp. 923-947.
- [193] Simple Micromechanical Model of Thermoelastic Martensitic Transformations. **Levitas V.I., Stein E.** Mech. Res. Commun., 1997, Vol. 24, No. 3, pp. 309-318.
- [194] Does Plastic Shear Affect the Phase Transitions under Compression of Materials in Bridgman Anvils? New Theoretical Study. **Levitas V.I.** High Pressure Physics and Technology, 1997, Vol. 7, No. 2, pp. 9-14.
- [195] Simulation of Martensitic Phase Transition Progress with Continuous and Discontinuous Displacements at the Interface. **Idesman A.V., Levitas V.I., Stein E.** Computational Materials Science, 1997, Vol. 9, No. 1-2, pp. 64-75.



## 1996

- [196] Theory of Martensitic Phase Transformations in Inelastic Materials in Local Description. **Levitas V.I.** Mech. Res. Commun., 1996, Vol. 23, No. 5, pp. 495-503.
- [197] Large Elastoplastic Deformations and Stress State of Deformable Gasket of High Pressure Apparatus with Diamond Anvils. **Levitas V.I., Polotnyak S.B., Idesman A.V.** Strength of Materials, 1996, No. 3, pp. 221-227.
- [198] Phase Transitions in Inelastic Materials at Finite Strains: a Local Description. **Levitas V.I.** J. de Physique IV, Colloque C1, supplément au J. de Physique III, 1996, Vol. 6, pp. 55-64.
- [199] On a Unified Approach to the Description of Phase Transitions and Strain Localization. **Levitas V.I., Stein E., Lengnick M.** Arch. Appl. Mech., 1996, Vol. 66, pp. 242-254.
- [200] Phase Transitions in Elastoplastic Materials: Thermodynamical Theory and Numerical Simulation. **Levitas V.I., Stein E., Idesman A.V.** J. de Physique IV, Colloque C1, supplément au J. de Physique III, 1996, Vol. 6, pp. 309-314.
- [201] A Nonconvex Problem for Solids with Phase Transformations. **Stein E., Levitas V.I., Kuczma M.S.** ZAMM, 1996, Vol. 76, Suppl. 5, pp. 499-500.

## 1995

- [202] Conditions of Nucleation and Interface Propagation in Thermoplastic Materials. **Levitas V.I.** J. de Physique IV, Colloque C8, supplément au J. de Physique III, 1995, Vol. 5, pp. 173-178.
- [203] Thermomechanics of Martensitic Phase Transitions in Elastoplastic Materials. **Levitas V.I.** Mech. Res. Commun., 1995, Vol. 22, No. 1, pp. 87-94.
- [204] Theory of Martensitic Phase Transitions in Elastoplastic Materials. **Levitas V.I.** Journal de Physique IV, Colloque C2, 1995, Vol. 5, pp. 41-46.
- [205] The Postulate of Realizability: Formulation and Applications to Post-Bifurcation Behavior and Phase Transitions in Elastoplastic Materials. Part 2. **Levitas V.I.** Int. J. Eng. Sci., 1995, Vol. 33, No. 7, pp. 947-971.
- [206] The Postulate of Realizability: Formulation and Applications to Post-Bifurcation Behavior and Phase Transitions in Elastoplastic Materials. Part 1. **Levitas V.I.** Int. J. Eng. Sci., 1995, Vol. 33, No. 7, pp. 921-945.
- [207] Thermodynamical Model of Martensitic Phase Transitions. **Levitas V.I., Stein E.** ZAMM, 1995, Vol. 75, pp. S199-S200.
- [208] Finite Element Procedure for Solving Contact Thermoplastic Problems at Large Strain, Normal and High Pressures. **Idesman A.I., Levitas V.I.** Computer Methods in Applied Mechanics and Engineering, 1995, Vol. 126, No. 1-2/15, pp. 39-66.

## 1994

- [209] Structural Strength of Cemented Carbide Deforming Broaches. **Levitas V.I., Nemirovskiy Ya.B., Polotnyak S.B.** Strength of Materials, 1994, Vol. 26, No. 7, pp. 534-539.
- [210] Stress-Strain Diagram of Metals under Large Uniform Compressive Strains. **Levitas V.I., Stashkevich I.E., Nemirovskiy A.B.** Strength of Materials, 1994, Vol. 26, No. 9, pp. 676-680.
- [211] Thermomechanical Description of Pseudoelasticity - the Threshold-Type Dissipative Force with Discrete Memory. **Levitas V.I.** Mechanics Research Communications, 1994, Vol. 21, No. 3, pp. 273-280.
- [212] Plasticity Theory of Microinhomogeneous Materials at Large Strain Gradient. **Levitas V.I.** Mechanics Research Communications, 1994, Vol. 21, No. 1, pp. 11-17.
- [213] Numerical Method for Optimizing the Design of High-Pressure Apparatus with Diamond Anvils. **Novikov N.V., Levitas V.I., Polotnyak S.B., Potemkin M.M.** Strength of Materials, 1994, Vol. 26, No. 4, pp. 294-302, <http://dx.doi.org/10.1007/BF02207410> .

### 1992

- [214] Laws of Thermodynamics for a Finite Volume of Microheterogeneous Medium. **Levitas V.I.** Mechanics of Solid, 1992, Vol. 27, No. 2, pp. 37-45
- [215] On Correct Account of Finite Rotations in Finite Plasticity Theory. **Levitas V.I.** Acta Mechanica Sinica, 1992, Vol. 8, No. 3, pp. 253-260.
- [216] Numerical Optimization of Diamond Anvil Cell Design. **Novikov N.V., Levitas V.I., Polotnyak S.B., Potyomkin M.M.** High Pressure Research, 1992, Vol. 8, pp. 507-509, <http://dx.doi.org/10.1080/08957959108260717>.

### 1991

- [217] Calculation of State of the System Abrasive Grain-Intermediate Plastic Layer-Charged Material. **Levitas V.I., Makovetskiy V.V.** Journal of Superhard Materials, 1991, No. 4, pp. 37-43.
- [218] Mathematical Modeling of Diamond Synthesis Process. **Novikov N.V., Levitas V.I., Leshchuk A.A., Idesman A.V.** High Pressure Research, 1991, Vol. 7, pp. 195-197.
- [219] Thermomechanical Model of the Appearance of a Diamond Nucleus. **Levitas V. I., Leshchuk A. A.** Journal of Superhard Material, 1991, 13, No. 3.
- [220] Estimation of the Required Accuracy of Temperature and Pressure Control in High Pressure Apparatus. **Pink R.L., Levitas V.I.** High Pressure Physics and Technology, 1991, Vol. 1, No. 3, pp. 1-7 (In Russian).
- [221] Numerical Modeling of Strength and Longevity of Structures with Allowance for Scale Effect. Communication 3. Investigation of the Stressed State, Strength and Longevity of Cylindrical-Type High-Pressure Apparatus. **Novikov N.V., Shestakov S.I., Levitas V.I., Borimskiy A.I., Idesman A.V.** Strength of Materials, 1991, No. 6, pp. 644-651.

- [222] Numerical Modeling of Strength and Longevity of Structures with Allowance for Scale Effect. Communication 2. Investigation of the Strength and Longevity of Hard-Alloy Die for High Pressure Apparatus. **Novikov N.V., Levitas V.I., Shestakov S.I.** Strength of Materials, 1991, No. 6, pp. 635-642.
- [223] Numerical Modeling of Strength and Longevity of Structures with Allowance for Scale Effect. Communication 1. Substantiation of Strength and longevity criterion. **Novikov N.V., Levitas V.I., Shestakov S.I.** Strength of Materials, 1991, No. 5, pp. 527-533.

#### 1990

- [224] Numerical Simulation of Press-Fitting of Matrix in a Block of Rings with Due Account of Plastic Deformation and Friction Forces. **Levitas V.I., Idesman A.V., Nemirovskiy A.B., Nemirovskiy Ya.B., Zherebtsov Yu.V., Stashkevich I.E., Gerovskiy A.I.** Strength of Materials, 1990, No. 11, pp. 978-983.
- [225] Structure of the Constitutive Relations for Phase Transformations in Two-Phase Thermoelastoplastic Composites. **Levitas V.I.** Papers of the Ukrainian SSR Academy of Sciences. Ser.A. 1990, No. 8, pp. 41-46. (In Russian).
- [226] Theoretical Description of Thermomechanical Effects in High Pressure Apparatus. **Novikov N.V., Levitas V.I., Idesman A.V.** High Pressure Research, 1990, Vol. 5, pp. 868-870.

#### 1989

- [227] Structure of the Constitutive Relations for Elasto-Plastic Composites at Finite Deformation. **Levitas V.I.** Papers of the Ukrainian SSR Academy of Sciences, Ser.A, 1989, No. 3, pp. 43-47. (In Russian).

#### 1988

- [228] Simulation of Diamond Synthesis Processes in a Reaction Zone of High Pressure Apparatus. **Novikov N.V., Levitas V.I., Leshchuk A.A., Idesman A.V.** Papers of the Ukrainian SSR Academy of Sciences, Ser.A, 1988, No. 7, pp. 40-43. (In Russian).
- [229] Elastoplastic Stressed-Strained State of Matrix of High Pressure Apparatus. **Tsibenko A.S., Levitas V.I., Shestakov S.I., Idesman A.V., Leshchuk A.A., Sokolov A.G.** Strength of Materials, 1988, No. 8, pp. 752-756.

#### 1987

- [230] Constitutive Relations for Anisotropic and Isotropic Elastoplastic-Creeping Media at Finite Strains. **Levitas V.I.** Papers of the Ukrainian SSR Academy of Sciences. Ser.A, 1987, No. 12, pp. 31-35. (In Russian).
- [231] Mechanical Testing of Materials at Hydrostatic Pressure up to 2 GPa and Temperature up to 900 K. **Novikov N.V., Levitas V.I., Nemirovskiy A.B., Stashkevich I.E.** High Pressure Physics and Technology, 1987, Vol. 26, pp. 37-39. (In Russian).

- [232] Numerical Simulation of the Stressed-Strained and Limiting States of the Elements of High Pressure Apparatus with Diamond Anvils. **Novikov N.V., Levitas V.I., Polotnyak S.B.** Journal of Superhard Materials, 1987, Vol. 9, No. 1, pp. 1-9.

#### 1986

- [233] Investigation of Stressed-Strained State of Cemented Carbide and Steel Matrices of High Pressure Apparatus of Cylindrical Type. **Levitas V.I., Shestakov S.I., Borimskiy A.I.** High Pressure Physics and Technology, 1986, Vol. 21, No. 7, pp. 70-73. (In Russian).
- [234] Solution of Thermoelastoplastic Problems in Contact Interaction by the Finite-Element Method. **Levitas V.I., Idesman A.V.** Strength of Materials, 1986, Vol. 20, No. 11, pp. 1518-1524.
- [235] Peculiarities of the Solution of Thermoelastoplastic Problems by the Finite-Element Method. **Levitas V.I., Idesman A.V.** Strength of Materials, 1986, Vol. 20, No. 10, pp. 1358-1364.
- [236] Theory of Large Elastoplastic Deformations Under High Pressure. **Levitas V.I.** Strength of Materials, 1986, Vol. 20, No. 8, pp. 1094-1103.
- [237] Constitutive Rate Equations for Isotropic and Anisotropic Elastoplastic Materials at Finite Strains. **Levitas V.I.** Papers of the Ukrainian SSR Academy of Sciences. Ser.A, 1986, No. 6, pp. 35-38. (In Russian).
- [238] Investigation of Plastic Deformation of a Single Microprojection of Rough Surface. **Chepovetskiy I.Kh., Levitas V.I., Yushchenko S.A.** Friction and Wear, 1986, Vol. 7, No. 5, pp. 841-850.
- [239] Fundamentals of Strength and Durability Calculations for the Elements of High Pressure Apparatus. **Novikov N.V., Levitas V.I., Shestakov S.I.** Physica, 1986, 139 & 140 B, pp. 782-784.

#### 1985

- [240] Some Relations for Dry Friction Systems. **Levitas V.I.** Soviet Physics Doklady, 1985, Vol. 30, No. 1, pp. 37-39.
- [241] Simulation of Thermoplastic Flow of Materials in High Pressure Apparatus. **Novikov N.V., Levitas V.I.** Bulletin of the Ukrainian SSR Academy of Sciences, 1985, No. 8, pp. 7-17. (In Ukrainian). (2)
- [242] Experimental Substantiation of Intensified Postulate of Perfect Plasticity at Quasimonotonic Loading. **Novikov N.V., Levitas V.I., Rosenberg O.A.** Papers of the Ukrainian SSR Academy of Sciences. Ser.A, 1985, No. 11, pp. 31-34. (In Russian).
- [243] Testing of Software Intended for the Solution of Thermomechanical Problems. **Novikov N.V., Levitas V.I., Zolotarev R.A., Idesman A.V., Leshchuk A.A., Polotnyak S.B.** Papers of the Ukrainian SSR Academy of Sciences. Ser.A, 1985, No. 4, pp. 30-33. (In Russian).
- [244] Solution of Contact Thermo-Elastoplastic Problems by Finite Element Method. **Novikov N.V., Levitas V.I., Idesman A.V.** Papers of the Ukrainian SSR Academy of Sciences. Ser.A, 1985, No. 1, pp. 28-33. (In Russian).

## 1984

- [245] Investigation of Load Carrying Capacity of Belt-Type High Pressure Apparatus Components. **Levitas V.I., Shestakov S.I., Dushinskaya G.V.** High Pressure Physics and Technology 1984, No. 15, pp. 43-46. (In Russian).
- [246] On the Experimental Substantiation of Intensified Postulate of Perfect Plasticity at Monotonic Loading. **Novikov N.V., Levitas V.I.** Papers of the Ukrainian SSR Academy of Sciences. Ser.A, 1984, No. 2, pp. 42-46. (In Russian).
- [247] Study of the Stress State of the Mechanical Elements of High-Pressure Equipment. **Novikov N.V., Levitas V.I., Shestakov S.I.** Strength of Materials, 1984, Vol. 16, No. 11, pp. 1550-1556.
- [248] Finite-Element Modeling of Electrical and Temperature Fields in a High Pressure Apparatus. **Levitas V. I., Shestakov S. I., Leshchuk A. A., Dushinskaya G. V.** High Pressure Physics and Technology, 1984, 16, pp. 66-70. (In Russian)
- [249] On Possible Mechanisms of Materials Transition from Plastic into Elastic State under Compression in High Pressure Apparatus. **Novikov N.V., Levitas V.I.** High Pressure Physics and Technology, 1984, No. 17, pp. 88-92. (In Russian).
- [250] On Intensified Postulate of Perfect Plasticity and Testing of Materials Using Bridgman Anvils. **Novikov N.V., Levitas V.I.** Journal of Superhard Materials, 1984, No. 2, pp. 3-11.
- [251] Numerical Simulation of Materials Stability Regions in a Working Volume of High Pressure Apparatus. **Novikov N.V., Levitas V.I., Leshchuk A.A.** Journal of Superhard Materials, 1984, No. 4, pp. 3-8.

## 1983

- [252] Stress Distribution in a Deformable Gasket of Toroidal High Pressure Equipment. **Levitas V.I., Dushinskaya G.V.** Journal of Superhard Materials, 1983, No. 5, pp. 6-10.
- [253] On Dissipation Postulate for Discrete and Continual Plastic Systems. **Levitas V.I.** Papers of the Ukrainian SSR Academy of Sciences. Ser.A, 1983, No. 1, pp. 26-32. (In Russian).
- [254] Toward the Theory of Large Elastoplastic Deformations. **Levitas V.I.** Papers of the Ukrainian SSR Academy of Sciences. Ser.A, 1983, No. 11, pp. 48-53. (In Russian).
- [255] Simulation of Electrical, Temperature and Thermostress Fields in High Pressure Apparatus by Finite Element Method. **Novikov N.V., Levitas V.I., Shestakov S.I., Leshchuk A.A., Dushinskaya G.V.** Journal of Superhard Materials, 1983, No. 3, pp. 3-8.

## 1982

- [256] Effect of Nonhydrostatic Stressed State on Phase Transformations. **Levitas V.I.** High Pressure Physics and Technology, 1982, No. 8, pp. 3-5. (In Russian).

## 1981

- [257] On Mechanico-Thermodynamic Analogy and Inertia of Thermodynamic Processes. **Levitas V.I.** Papers of the Ukrainian SSR Academy of Sciences. Ser.A, 1981, No. 10, pp. 39-46. (In Russian).
- [258] Stressed State of a Reaction Container of a Recessed Anvil-Type High Pressure Chamber. **Levitas V.I.** Superhard Materials, 1981, No. 3, pp. 9-13. (In Russian).

### 1980

- [259] Some Models of the Inelastic Deformation of Materials. Communication 2. Some Applications and Generalizations. **Levitas V.I.** Strength of Materials, 1980, Vol. 12, No. 12, pp. 1546-1552.
- [260] Some Models of the Inelastic Deformation of Materials. Communication 1. Theory of Plasticity Taking Structural Changes into Account. **Levitas V.I.** Strength of Materials, 1980, Vol. 12, No. 12, pp. 1536-1545.
- [261] Developing a Theory of Perfect Plasticity. **Levitas V.I.** Strength of Materials, 1980, No. 11, pp. 1394-1402.
- [262] Method of Constructing a Plasticity Theory. **Levitas V.I.** Strength of Materials, 1980, Vol. 12, No. 4, pp. 494-500.
- [263] On the Limit State of Composite Materials Consisting of Rigid Grains and a Plastic Matrix. **Novikov N.V., Levitas V.I., Devin L.N.** Papers of the Ukrainian SSR Academy of Sciences. Ser.A, 1980, No. 11, pp. 53-59. (In Russian).
- [264] The Solution of Axisymmetric Problem of Materials Plastic Flow in Certain High Pressure Chambers. **Novikov N.V., Levitas V.I.** Superhard Materials, 1980, No. 5, pp. 3-11. (In Russian).
- [265] Stressed State Analysis of Plastic Interlayers Between Rigid Grains. **Novikov N.V., Devin L.N., Levitas V.I.** Superhard Materials, 1980, No. 2, pp. 16-23 (In Russian).

### 1979

- [266] On the Nonlinear Theory of Dissipative Processes. **Levitas V.I.** Ukrainian Physical Journal, 1979, Vol. 24, No. 1, pp. 102-110.
- [267] The Motion at Anisotropic Friction and its Relation to the Plasticity Theory. **Levitas V.I.** Bulletin of Kiev Polytechnic Institute, 1979, No. 6, pp. 52-56. (In Russian).
- [268] Constitutive Relations in the Theory of Dissipative Media. **Levitas V.I.** Strength of Materials, 1979, Vol. 11, No. 6, pp. 48-55.

### 1978

- [269] The Principle of Maximum of Scalar Product and its Application to Determine  $\sigma - \varepsilon$  Relation in Anisotropic Dissipative Media. **Levitas V.I.** Papers of the Ukrainian SSR Academy of Sciences. Ser.A, 1978, No. 7, pp. 618-621. (In Russian).

## Chapters in Books

- [270] My Academic Father. In: Novikov Mikola Vasil'ovich. My Ukraine - My Motherland. Book of recollections of and about Academician N.V. Novikov. **Levitas V.I.**, Kiev, Success and Career , 2018, pp. 388-412.
- [271] Apparent and Hidden Mechanochemistry. In: Experimental and Theoretical Studies in Modern Mechanochemistry. **Levitas V.I.**, pp. 41-56. Eds. F. Delogu and G. Mulas (Transworld Research Network, 2010).
- [272] Continuum Mechanical Fundamentals of Mechanochemistry. **Levitas V.I.** High Pressure Surface Science and Engineering. Section 3. Institute of Physics, Bristol and Philadelphia, Eds. Y. Gogotsi and V. Domnich, 2004, pp. 159-292.
- [273] Study of material behavior in high pressure apparatuses with diamond anvils. **Novikov N. V., Polotnyak S. B., Levitas V. I., Shvedov L. K.** Superhard Materials, Synthesis and Applications. Vol. 2 Structure and properties of superhard materials, methods of investigations. Chapter 1. pp. 13-40. Kiev, Institute for Superhard Materials, Ed. N. V. Novikov, 2004.
- [274] Modeling of thermomechanical state of reaction cell of high pressure apparatuses during spontaneous diamond crystallization. **Leshchuk A. A., Novikov N. V., Levitas V. I.** Superhard Materials, Synthesis and Applications. Vol. 1 Synthesis of diamond and similar materials. Chapter 3. pp. 96-118. Kiev, Institute for Superhard Materials, Ed. N. V. Novikov, 2003.
- [275] General Structure of Constitutive Equations for Large Elastoplastic Deformations under High Pressure. **Levitas V.I., Novikov N.V.** Effect of High Pressure on Substances. Vol. 2. Physics and Technology of Deformation at High Pressure. Chapter 3, pp.50-63 Kiev, Naukova Dumka, 1987. (In Russian).
- [276] Experimental Regularities and Concrete Models for Large Elastoplastic Deformations under High Pressure. **Levitas V.I., Novikov N.V.** Effect of High Pressure on Substances. Vol. 2. Physics and Technology of Deformation at High Pressure. Chapter 4, pp.64-70. Kiev, Naukova Dumka, 1987. (In Russian).
- [277] Structural Strength of Materials Sensetive to Scale Effect. **Novikov N.V., Levitas V.I.** Effect of High Pressure on Substances. Vol. 2. Physics and Technology of Deformation at High Pressure. Chapter 5, pp.71-74, Kiev, Naukova Dumka, 1987. (In Russian).
- [278] Durability of Materials under Complex Stress State. **Novikov N.V., Levitas V.I.** Effect of High Pressure on Substances. Vol. 2. Physics and Technology of Deformation at High Pressure. Chapter 6, pp.75-79. Kiev, Naukova Dumka, 1987. (In Russian).
- [279] Mechanical State of Solid-Phase High Pressure Apparatuses. **Novikov N.V., Levitas V.I., Shestakov S.I.** Effect of High Pressure on Substances. Vol. 2. Physics and Technology of Deformation at High Pressure. Chapter 9. pp.98-110, Kiev, Naukova Dumka, 1987. (In Russian).
- [280] Development of High Pressure Technics. **Novikov N.V., Gerasimovich A.V., Loshak M.G., Levitas V.I., Andreev V.D.** Synthetic Superhard Materials. Vol. 1. Synthesis of Superhard Materials. Chapter 2. Kiev, Naukova Dumka, 1986. pp.37-85 (In Russian).

## Editorials

- [281] Editorial. **Levitas V.I. and Stein E.** (Guest Editors). *Int. J. Plasticity*, 2000, Vol. 16, No. 7-8, pp. 721-722. Special Issue: Phase Transitions and Other Structural Changes in Inelastic Materials.
- [282] Editorial. **Levitas V.I. and Cherkaoui M.** (Guest Editors). *Int. J. Plasticity*, 2002, Vol. 18, p. 1425. Special Issue: Physics and Mechanics of Phase Transformations.
- [283] Afterword. **Levitas V.I.** In Levin V.A., Kalinin V.V., Zingerman K.M., and Vershinin A.V. *Developments of Defects under Finite Strains. Computational and Physical Modeling*. Moscow, Physmatgiz, 2007, pp. 360-363.

#### Edited book

- [284] Proceedings of the International Conference on Martensitic Transformations (ICOMAT 2017), Chicago, IL, July 7-14, 2017. Eds. Aaron Stebner, Greg Olson, Valery Levitas, Emmanuel De Moor, Othmane Benafan, Ibrahim Karaman, Mohsen Asle Zaeem, Peter Anderson, David Rowenhorst, Avadh Saxena, Reginald Hamilton, Alan Pelton, Peter Müllner, Michael Mills, and Ricardo Komai.

#### Proceedings of Conferences

- [285] Phase field approach to bridging between atomistic and macroscopic cohesive laws. **Jafarzadeh H., Farrahic G. H., Javanbakht M., and Levitas V.I.**, Proceedings of the 27th Annual International Conference on Mechanical Engineering, April 30-May 2, 2019, Tarbiat Modares University, Tehran, 57-61.
- [286] Plastic strain induced phase transformations in rotational diamond cell. **V.I. Levitas**. Promoting Advanced Energy Materials by SPD and Phase Transformation. Proceedings of the International Workshop on Giant Straining for Advanced Materials (GSAM2017). Eds. Kaveh Edalati, Yoshifumi Ikoma, and Zenji Horita. IRC GSAM, Kyushi University, pp. 9-12.
- [287] Phase Transformations under High Pressure and Large Plastic Deformations: Multiscale Theory and Interpretation of Experiments. **Levitas V.I.** Proceedings of the International Conference on Martensitic Transformations: Chicago (ICOMAT 2017), plenary lecture, Chicago, IL, July 7-14, 2017. Eds. Aaron Stebner, Greg Olson, Valery Levitas, et al., The Minerals, Metals & Materials Society, 2018, pp. 3-10.
- [288] Phase Transition and Its Interactions with Dislocations. **Levitas V.I., Chen H., and Xiong L.** Proceedings of the International Conference on Martensitic Transformations: Chicago (ICOMAT 2017), Chicago, IL, July 7-14, 2017. Eds. Aaron Stebner, Greg Olson, Valery Levitas, et al. The Minerals, Metals & Materials Society, 2018, pp. 83-88.
- [289] Modeling The Microstructure Evolutions of NiTi Thin Film During Tension. **S. E. Esfahani, I. Ghamarian, V.I. Levitas, P. Collins.** Proceedings of the International Conference on Martensitic Transformations: Chicago (ICOMAT 2017), Chicago, IL, July 7-14, 2017. Eds. Aaron Stebner, Greg Olson, Valery Levitas, et al. The Minerals, Metals & Materials Society, 2018, pp. 53-58
- [290] Modeling of Strain-Induced Phase Transformations under High Pressure and Shear. **M. Kamrani, B. Feng, V.I. Levitas.** Proceedings of the International Conference on Martensitic Transformations: Chicago (ICOMAT 2017), Chicago, IL, July 7-14, 2017. Eds. Aaron Stebner, Greg Olson, Valery Levitas, et al. The Minerals, Metals & Materials Society, 2018, pp. 47-52.



- [291] Phase Field Study of Lattice Instability and Microstructure Evolution in Silicon During Phase Transformation under Complex Loading. **H. Babaei and V.I. Levitas**. Proceedings of the International Conference on Martensitic Transformations: Chicago (ICOMAT 2017), Chicago, IL, July 7-14, 2017. Eds. Aaron Stebner, Greg Olson, Valery Levitas, et al. The Minerals, Metals & Materials Society, 2018, pp. 167-170.
- [292] Nanoscale Phase Field Modeling and Simulations of Martensitic Phase Transformations and Twinning at Finite Strains. **A. Basak and V.I. Levitas**. Proceedings of the International Conference on Martensitic Transformations: Chicago (ICOMAT 2017), Chicago, IL, July 7-14, 2017. Eds. Aaron Stebner, Greg Olson, Valery Levitas, et al. The Minerals, Metals & Materials Society, 2018, pp. 161-166.
- [293] Strain-induced phase transformations under high pressure and shear in rotational diamond anvil cell. **V. I. Levitas**. International Conference "High Pressure Effects On Materials" (Kyiv, ISM NASU, June 28 - July 1, 2011). Eds. M.V. Novikov, V.Z. Turkevych, O.O. Lyeshchuk. NAS of Ukraine, Bakul Institute of Superhard Materials, Kyiv, EPC ALCON, 2012.
- [294] Mechanochemical mechanism for fast reaction of metastable intermolecular composites based on dispersion of liquid metal (**Invited paper**). **V. I. Levitas and M. L. Pantoya**. Energetic Material Synthesis and Combustion Characterization for Chemical Propulsion. Proceedings of the 7th International Symposium on Special Topics in Chemical Propulsion, September 17-21, 2007, Kyoto, Japan. Volume Editors K. K. Kuo and K. Hori, N. Y., Begell House, 2009, p. 19-39.
- [295] Virtual melting as a possible new mechanism for various structural changes in solids. **V. I. Levitas**. NSF CMMI Engineering and Innovation Conference (Grantee Meeting) 2008, Knoxville, TN, January 7-10, 2008, 8 p.
- [296] Virtual melting and amorphization as mechanisms of high strain rate plastic deformation. **V. I. Levitas and R. Ravelo**. Mechanics and Mechanisms of Finite Plastic Deformation. Proceedings of "Plasticity'08" (Ed. A. S. Khan and B. Farrokh) Neat Press, Fulton, Maryland, 2008, 286-288 (**Keynote lecture**).
- [297] Strain-induced phase transformations under compression and shear in a rotational diamond anvil cell: in-situ x-ray diffraction study and modeling. **V. I. Levitas, Y. Ma and J. Hashemi**. Proceedings of "Plasticity'05" (Ed. A. Khan et al.) Neat Press, Fulton, Maryland, 2005, 493-495 (**Keynote lecture**).
- [298] Strain-induced phase transformations and chemical reactions under high pressure: a microscale three-phase model. **O. Zarechnyy and V. I. Levitas**. Proceedings of the Third Joint ASME Region X Technical Conference, March 31-April 2, 2005, Lubbock, TX, USA, IDPT-Vol.2, pp. 128-134, 2005.
- [299] Thermodynamics and kinetics of sublimation inside of elastoplastic material. **N. Altukhova and V.I. Levitas**. Proceedings of the Third Joint ASME Region X Technical Conference, March 31-April 2, 2005, Lubbock, TX, USA, IDPT-Vol.2, pp. 4-11, 2005.
- [300] Stress-induced martensitic phase transformation: Stability of stationary solutions, functionally graded nanophases and transient dynamics. **Dong-Wook Lee and Levitas V. I.** Proceedings of the Third Joint ASME Region X Technical Conference, March 31-April 2, 2005, Lubbock, TX, USA, IDPT-Vol.2, pp. 52-56, 2005.

- [301] Interface Reorientation in Stress Induced Martensitic Phase Transformations in Elastic Materials. **Ozsoy I. B. and Levitas V. I.** Proceedings of the Third Joint ASME Region X Technical Conference, March 31-April 2, 2005, Lubbock, TX, USA, IDPT-Vol.2, pp. 65-71, 2005.
- [302] Sublimation inside of elastoplastic material. **N. Altukhova and V. I. Levitas.** Regional Proceedings: ASME Southwest Region X Technical Conference, 2004.
- [303] Ginzburg-Landau Equation: Stability Of Stationary Solutions, Transient Dynamics, Interface Propagation And Functionally Graded Nanophases **D.-W. Lee and V. I. Levitas.** Regional Proceedings: ASME Southwest Region X Technical Conference, 2004.
- [304] Strain-induced phase transformations and chemical reactions under high pressure: a microscale three-phase model. **O. M. Zarechnyy and V. I. Levitas.** Regional Proceedings: ASME Southwest Region X Technical Conference, 2004.
- [305] Modeling Thermodynamics, Kinetics And Crystallography Of Stress-Induced Martensitic Transformation With Allowing For Slip And Twinning. **I. B. Ozsoy, V. I. Levitas.** Regional Proceedings: ASME Southwest Region X Technical Conference, 2004.
- [306] High Pressure Mechanochemistry: Conceptual Multiscale Theory and Interpretation Of Experiments. **Levitas V.I.** Proceedings of "Plasticity'03" (Ed. A. Khan et al.) Neat Press, Fulton, Maryland, 2003, pp. 484-486 (**Keynote lecture**).
- [307] Numerical Simulation of Martensitic Phase Transitions. **Idesman A., Levitas V.I. and Preston D.** Proceedings of "Plasticity'03" (Ed. A. Khan et al.) Neat Press, Fulton, Maryland, 2003, pp. 130-132.
- [308] Landau Theory for Multivariant Stress-Induced Martensitic Phase Transformations. **Levitas V.I., Preston D.L. and Lee D.-W.** Proceedings of "Plasticity'03" (Ed. A. Khan et al.). Neat Press, Fulton, Maryland, 2003, pp. 223-225.
- [309] Micromechanical Modeling of Strees-Induced Martensitic Transformation. **V. I. Levitas, I. B. Ozsoy.** Regional Proceedings: Great International Southwest Region X Graduate Student Technical Conference, 2003.
- [310] Analytical Solutions for Critical Nuclei And Interface Structure for A New Landau Theory for Stress-Induced Martensitic Phase Transformation. **V. I. Levitas, D.-W. Lee.** Regional Proceedings: Great International Southwest Region X Graduate Student Technical Conference, 2003.
- [311] Phase Transformation  $r\text{BN} \rightarrow c\text{BN}$  Induced by Rotational Plastic Instability. **Levitas V.I.** (Ed. A. Khan et al.). Proceedings of "Plasticity'02", Neat Press, Fulton, Maryland, 2002, pp. 198-200 (**Keynote lecture**).
- [312] Phase Field Theory of Martensitic Transformation in Inelastic Materials. **Levitas V.I.** (Ed. A. Khan et al.). Proceedings of "Plasticity'02", Neat Press, Fulton, Maryland, 2002, pp. 195-197.
- [313] Landau-Ginzburg Theory and Modeling for Multivariant Stress-Induced Martensitic Phase Transformations. **V. I. Levitas, D.-W. Lee.** Proceeding of ASME 2002 Graduate Student Technical Conference(GSTC).

- [314] Continuum Modeling of Martensite Crystallography. **V. I. Levitas, I. B. Ozsoy**. Proceeding of ASME 2002 Graduate Student Technical Conference (GSTC).
- [315] Thermomechanical and Kinetic Description of Fracture in Inelastic Materials. **Levitas V.I.** *Plastic and Viscoplastic Response of Materials and Metal Forming*. (Ed. A. Khan et al.). Proceedings of “Plasticity’00”, Neat Press, Fulton, Maryland, 2000, pp. 419-421.
- [316] General Approach For The Description Of Structural Changes In Inelastic Materials With Application To Phase Transitions, Ductile Fracture And Strain-Induced Chemical Reactions. **Levitas V.I.** *Proceedings Of Fourth International Conference On Constitutive Laws For Engineering Materials: Experiment, Theory, Computation And Applications* (Eds. R.C. Picu and E. Krempl). RPI, Troy, New York, USA, 1999, pp. 249-252 (**Invited lecture**).
- [317] Micromechanically-Based Constitutive Equations For Shape Memory Alloys. **Levitas V.I.** *Proceedings Of Fourth International Conference On Constitutive Laws For Engineering Materials: Experiment, Theory, Computation And Applications*. (Eds. R.C. Picu and E. Krempl). RPI, Troy, New York, USA, 1999, pp. 309-312.
- [318] Micromechanical Derivation of the Structure of Macroscopic Constitutive Equations for Transformational Mechanisms of Plasticity. **Levitas V.I.** *Constitutive and Damage Modeling of Inelastic Deformation and Phase Transformation*. (Ed. A. Khan). Proceedings of “Plasticity’99”, Neat Press Fulton, Maryland, 1998, pp. 239-242.
- [319] General Thermomechanical and Kinetic Approach to Structural Changes in Inelastic Material. **Levitas V.I.** *Constitutive and Damage Modeling of Inelastic Deformation and Phase Transformation*. (Ed. A. Khan). Proceedings of “Plasticity’99” (Ed. A. Khan), Neat Press Fulton, Maryland, 1998, pp. 235-238 (**Keynote lecture**).
- [320] Phase Transitions in Dissipative Materials: Theory and Interpretation of Experiments. **Levitas V.I., Stein E.** Proceedings of the IUTAM Symposium on Micro- and Macrostructural Aspects of Thermo-plasticity, Bochum, Germany, 25-29 August 1997 (Eds. O. T. Bruhns, E. Stein), 1999, pp. 307-318. Kluwer Academic Publishers, Dordrecht, Netherlands (**Keynote lecture**).
- [321] Strain-Induced Chemical Reactions in Shear Bands: Experiments and Modelling. **Levitas V.I., Nesterenko V.F., Meyers M.A.** *Constitutive and Damage Modeling of Inelastic Deformation and Phase Transformation*. Proceedings of “Plasticity’99” (Ed. A. Khan), Neat Press Fulton, Maryland, 1998, pp. 243-246.
- [322] Computational Approach to Interaction Between Phase Transition and Plasticity at Finite Strains. **Idesman A.V., Levitas V.I., Stein E.** *Constitutive and Damage Modeling of Inelastic Deformation and Phase Transformation*. Proceedings of “Plasticity’99”, (ed. A. Khan). Neat Press Fulton, Maryland, 1998, pp. 215-218 (**Keynote lecture**).
- [323] Computational Methods for Elastoplastic Materials with Martensitic Phase Transitions. **Idesman A.V., Levitas V.I., Stein E.** Proceedings of the IUTAM Symposium on Micro- and Macrostructural Aspects of Thermo-plasticity Bochum, Germany, 25-29 August 1997 (Eds. O. T. Bruhns, E. Stein), 1999, pp. 373-382. Kluwer Academic Publishers, Dordrecht, Netherlands.

- [324] Martensitic Phase Transformations in Inelastic Materials: Thermomechanical Theory, Analytical Solutions and Interpretations of Experiments. **Levitas V.I.** *Physics and Mechanics of Finite Plastic & Viscoplastic Deformation*. (Ed. A. Khan). Proceedings of “Plasticity’97”, Neat Press Fulton, Maryland, 1997, pp. 161-162.
- [325] New View of the Problem of Plastic Spin. **Levitas V.I.** *Physics and Mechanics of Finite Plastic & Viscoplastic Deformation*. (Ed. A. Khan). Proceedings of “Plasticity’97”, Neat Press Fulton, Maryland, 1997, pp. 57-58.
- [326] Computational Mechanics of Elastoplastic Materials with Martensitic Phase Transitions. **Idesman A.V., Levitas V.I., Stein E.** *Physics and Mechanics of Finite Plastic & Viscoplastic Deformation*. (Ed. A. Khan). Proceedings of “Plasticity’97”, Neat Press Fulton, Maryland, 1997, pp. 155-156.
- [327] Nonisothermal Hysteresis Loops in Pseudoelasticity. **Kuczma M.S., Levitas V.I., Mielke A., Stein E.** Proceedings of the XIII Conference on Computer Methods in Mechanics, Posnan, 5-8 May 1997, pp. 711-718.
- [328] Finite Element Simulation of Martensitic Phase Transition in Elastoplastic Material at Finite Strains. **Idesman A.V., Levitas V.I., Stein E.** COMPUTATIONAL PLASTISITY. FUNDAMENTALS AND APPLICATIONS. Part 2. (Eds. D. R. J. Owen, E. Oñate, E. Hilton). Proceedings of the Fifth International Conference on Computational Plasticity. Barcelona, Spain, 1997, pp. 1323-1328.
- [329] Computer Simulation of Phase Transition in Elastoplastic Materials. **Levitas V., Idesman A.V., Stein E.** *Numerical Methods in Engineering’96* (Eds. J.-A. Désidéri, P. Le Tallec, E. Oñate, J. Périaux, E. Stein). Proceedings of the Second ECCOMAS Conference on Numerical Methods in Engineering. Paris, France, 1996, pp. 374-380.
- [330] Some Relations for Finite Inelastic Deformation of Microheterogeneous Materials with Moving Discontinuity Surfaces. **Levitas V.I.** *IUTAM Symposium on Micromechanics of Plasticity and Damage of Multiphase Materials* (Eds. A. Pineau & A. Zaoui). Proceedings of IUTAM Symposium. Paris, France, 1996, pp. 313-320.
- [331] Phase Transitions under Compression and Shear of Materials in Bridgman Anvils: Theory and Interpretation of Experiments. **Levitas V.I.** In *High Pressure Science and Technology* (ed. W. A. Trzeciakowski). Proceedings of the Joint XV AIRAPT and XXXIII EHPRG International Conference, Warsaw 1995, pp. 147-149.
- [332] Phase Transitions in Elastoplastic Materials: Thermodynamical Theory and Numerical Simulation. **Levitas V.I., Stein E., Idesman A.V.** Proceedings of IMMM’95, International Academic Publishers, pp. 581-586.
- [333] Micromechanical Model of Transformation Induced Plasticity. **Levitas V.I., Stein E.** Dynamic Plasticity and Structural Behaviours (Ed. S. Tanimura & A. Khan). Proceedings of “Plasticity’95”, 1995, pp. 335-338.
- [334] Finite-Element Simulation of Elastoplastic Properties of Two-Phase Composites Reinforced by Particles. **Idesman A.V., Levitas V.I., Stein E.** *IUTAM Symposium on Micromechanics of Plasticity and Damage of Multiphase Materials* (Eds. A. Pineau & A. Zaoui), 1996. Proceedings of IUTAM Symposium. Paris, France, 1995, pp. 83-90.

- [335] Plastic Spin for Single and Polycrystals - the Stability Approach. **Levitas V.I.** Dynamic Plasticity and Structural Behaviours (Ed. S. Tanimura & A. Khan). Proceedings of "Plasticity'95", 1995, pp. 261-264. Gordon and Breach Publishers (**Keynote lecture**).
- [336] On the Theory of Large Elastoplastic Deformations. **Levitas V.I.** Grosse plastische Formänderungen (Ed. O.T. Bruhns) Workshop "Grosse plastische Formänderungen", Bad Honnef 1994, pp. 34-37.
- [337] Numerical Modeling of Thermomechanical Processes in High Pressure Apparatus Applied for Superhard Materials Synthesis. **Levitas V.I., Idesman A.V., Leshchuk A.A., Polotnyak S.B.** High Pressure Science and Technology. Proceedings the XI AIRAPT International Conference. Kiev, Naukova Dumka, 1989, Vol. 4, pp. 38-41.
- [338] Simulation of Large Thermo-Elastoplastic Deformations of Materials under High Hydrostatic Pressure. **Levitas V.I.** Strength of Materials and Structure Components Under Complex Stressed State. Proceedings of All-Union Symposium, Kiev, Naukova Dumka, 1986, pp. 151-155. (In Russian).
- [339] Extremum Principles in Thermomechanics of Dissipative Media. **Levitas V.I.** Proceedings of the 2nd Republican Young Scientists Conference on Mechanics, Kiev, Naukova Dumka, 1979, pp. 113-116. (In Russian).

#### Theses

- [340] Large Elastoplastic Deformation of Materials at High Pressure. **Levitas V.I.** Doctor of Science Thesis (habilitation) in Physics and Mathematics. Moscow, Moscow Institute of Electronic Mashinebuilding, 1988, 475 P. (In Russian).
- [341] Simulation of Materials Plastic Flow at High Hydrostatic Pressure. **Levitas V.I.** Candidate of Science Thesis (Ph. D) in Materials Science in Machinery, Kiev, Institute for Superhard Materials, 1981, 271 P. (In Russian).

#### Papers in Books

- [342] Displacive phase transitions at large strains: Phase-field theory and simulations. **Levin V. A., Levitas V. I., Lokhin V.V., and Zingerman K.M.**, Modern Problems of Mathematics and Mechanics. Moscow State University, Moscow, 2009, Vol. 2, pp. 507-511 (in Russian).
- [343] Crystal-amorphous and crystal-crystal phase transformations via virtual melting. **Levitas V.I.** Superhard Materials: Production and Application. (Eds. V. Z. Turkevich and S. A. Klimenko), Material Science Serial, Kiev, Institute for Superhard Materials, 2007, pp. 33-40
- [344] Strain-induced disorder and phase transformation in hexagonal boron nitride under quasi-homogeneous pressure up to 25 GPa: in-situ X-ray study in a rotational diamond anvil cell. **Levitas, V. I., Ma, Y. and Hashemi, J.** Innovative Superhard Materials and Sustainable Coatings for Advanced Manufacturing, Springer, Netherlands, 2004, pp. 31-41.
- [345] Synthesis of Superhard Phases of Boron Nitride in a Rotation Diamond Anvil Cell. **Levitas, V. I., Hashemi, J., Mathis, W., Holtz, M., and Ma, Y.** Brookhaven National Laboratory Year Book, 2002.

- [346] X-ray diffraction study of superhard BN phases synthesized in a rotational diamond anvil cell. **Y. Ma, V. Levitas, J. Hashemi, W. Mathis, and M. Holtz**. Brookhaven National Laboratory Year Book, 2002.
- [347] Experimental Study of the Effect of Shear Strain on Phase Transformations in Various Materials. **Novikov, N. V., Shvedov L. K., Levitas, V. I., Petrusha, I. A., and Polotnyak, S. B.** Synthesis, Sintering and Properties of Superhard Materials. (Ed. A. A. Shulzhenko), Material Science Serial, Kiev, Institute for Superhard Materials, 2000, pp. 131 - 144. (In Russian).
- [348] Ductile Fracture: New Thermomechanical and Kinetic Approach and Numerical Study. **Levitas V.I., Idesman A.V.** Theoretische und Numerische Methoden in der Angewandten Mechanik mit Praxisbeispielen. Festschrift anlässlich der Emeritierung von Prof. Erwin Stein. (Ed. R. Mahnken). Universität Hannover. Institut für Baumechanik und Numerische Mechanik, IBNM-Bericht 98/4, 1998, pp. 65-72.
- [349] Numerical Modeling of a Diamond Synthesis Process with Allowing for Coupling of Physical-Mechanical Processes Running in the HPA. **Levitas V. I., Leshchuk A. A.** Superhard Materials in Industry, Kiev, Institute for Superhard Materials, 1989, pp. 7-10. (In Russian)
- [350] Stressed-Strained State of High Pressure Apparatus Components with Due Account of Large Deformations. **Idesman A.V., Levitas V.I.** Production, Investigation and Applications of Superhard Materials. Kiev, Naukova Dumka, 1986, pp. 80-85. (In Russian).
- [351] Calculation of Thermal Stresses for an Individual Rock Cutting Element. **Koshovsky V. F., Ganiev R. G., Leshchuk A. A., Levitas V. I.** Drilling Tool Made of Superhard Materials, Kiev, Institute for Superhard Materials, 1986, pp. 52-56. (In Russian)
- [352] Investigation of Nonisothermal Plastic Flow of a Container and Reaction Mixture of High Pressure Apparatus. **Levitas V.I., Idesman A.V., Leshchuk A.A.** Modern Engineering and Methods of Experimental Mineralogy. Moscow, Nauka, 1985, pp. 235-237. (In Russian).
- [353] Investigation of Stressed-Strained State of Force Components of High Pressure Apparatus. **Novikov N.V., Levitas V.I., Shestakov S.I.** Modern Engineering and Methods of Experimental Mineralogy. Moscow, Nauka, 1985, 5 P. (In Russian).
- [354] Problems of Solid-Phase High Pressure Apparatus Optimization. **Novikov N.V., Gerasimovich A.V., Levitas V.I.** Modern Engineering and Methods of Experimental Mineralogy. Moscow, Nauka, 1985, pp. 199-203. (In Russian).
- [355] Stressed-Strained State of Components of High Pressure Apparatus with Diamond Anvils. **Novikov N.V., Levitas V.I., Polotnyak S.B., Zolotarev R.A.** Effect of High Pressure on Structure and Properties of Superhard Materials. Kiev, Institute for Superhard Materials, 1985, pp. 65-70. (In Russian).
- [356] Numerical Simulation of Strength and Durability of High Pressure Apparatus. **Levitas V.I., Shestakov S.I.** Production, Investigations and Applications of Superhard Materials. Kiev, Institute for Superhard Materials, 1984, pp. 100-103. (In Russian).
- [357] Stressed State of the Reaction Container of a Recessed Anvil-Type High Pressure Chamber. **Levitas V.I.** Effect of High Pressure on Materials Properties. Kiev, Naukova Dumka, 1983, pp. 196-199. (In Russian).

- [358] Theory of Large Elastoplastic Deformations of Materials under High Pressure. **Levitas V.I.** Effect of High Pressure on Structure and Properties of Materials. Kiev, Institute for Superhard Materials, 1983, pp. 3-16. (In Russian).
- [359] Limit State of High Pressure Apparatus. **Levitas V.I., Shestakov S.I., Maystrenko A.L.** Effect of High Pressure on Structure and Properties of Materials. Kiev, Institute for Superhard Materials, 1983, pp. 128-131. (In Russian).
- [360] Thermodynamics of Materials Dynamic Deformation. **Levitas V.I.** Synthesis and Applications of Superhard Materials. Kiev, Institute for Superhard Materials, 1981, pp. 1-5. (In Russian).
- [361] Flow at Anisotropic Contact Friction. **Levitas V.I.** Physical Processes in Metal Cutting. Volgograd, Volgograd Polytechnic Institute, 1980, Vol. 1, pp. 62-68. (In Russian).

### Preprints and Reports

- [362] Fatigue-resistant high-performance elastocaloric materials via additive manufacturing **Hou H., Simsek E., Ma T., Johnson N. S., Qian S., Cisse C., Stasak D., Hasan N. A., Zhou L., Hwang Y., Radermacher R., Levitas V. I., Kramer M. J., Zaeem M. A., Stebner A. P., Ott R. T., Cui J., Takeuchi I.** <http://arxiv.org/abs/1908.07900>, August 21, 2019, 38 pp.
- [363] Imaging stress and magnetism at high pressures using a nanoscale quantum sensor. **Hsieh S., Bhattacharyya P., Zu C., Mittiga T., Smart T. J., Machado F., Kobrin B., Höhn T. O., Rui N. Z., Kamrani M, Chatterjee S., Choi S., Zaletel M., Struzhkin V. V, Moore J. E., Levitas V. I., Jeanloz R., Yao N. Y.** arXiv:1812.08796 [cond-mat.mes-hall; cond-mat.mtrl-sci], December 20, 2018, 68 P.
- [364] Deformation, lattice instability, and metallization during solid-solid structural transformations under general applied stress tensor: example of Si I→Si II. **Zarkevich N. A., Chen H., Levitas V. I., and Johnson D. D.** arXiv:1806.00055 [cond-mat.mtrl-sci], May 31, 2018 10 P.
- [365] Twinning-induced pseudoelastic behavior in  $(\text{MoW})_{85}(\text{TaTi})_{7.5}\text{Zr}_{7.5}$ . **Sharma A., Levitas V.I., Singh P., Basak A, Balasubramanian G., and Johnson D. D.** arXiv:1809.06822, September 18, 2018, 4 P.
- [366] Shear driven formation of nano-diamonds at sub-gigapascals and 300 K. **Gao Y., Ma Y., An Q., Levitas V. I., Zhang Y., Feng B., Chaudhuri J., and Goddard III W. A.** arXiv:1805.11239 [cond-mat.mtrl-sci], May 29, 2018, 15 P.
- [367] A Variational Formulation of Rate-Independent Phase Transformations Using an Extremum Principle. **Mielke A., Theil F., Levitas V.I.** Universität Stuttgart, Preprint 15, SFB 404, 2000, 39 P.
- [368] Stress- and Strain-Induced Phase Transformations in Engineering Materials. New Concepts and Solutions for Microstructural Experiments, Modeling, Analysis And Computations From Point Of View Of Material Science, Continuum Thermodynamics And Mathematics. **E. Stein, V.I. Levitas, E. Hornbogen, A. Mielke et al.** Report of multidisciplinary research project I/70281, I/70283, I/70284 supported by Volkswagen Foundation, University of Hannover, Germany, 1999, 98 p.

- [369] Theorie und Numerik der Mittelungsbildung für thermoelastoplastische, mikroheterogene Werkstoffe mit Phasenumwandlungen und deren Anwendung bei Wärmebehandlung metallischer Bauteile. **E. Stein, V. I. Levitas**. Report of research project Ste 238/44-1 supported by German Research Society. University of Hannover, 1999, 15 p. (In German).
- [370] A study of a hamiltonian model for martensitic phase transformations including microkinetic energy. **Theil F., Levitas V.I.** arXiv.org > patt-sol > arXiv:patt-sol/9811006, November 19, 1998, 29 P.
- [371] Mathematical Formulation of Quasistatic Phase Transformations with Friction Using an Extremum Principle. **Mielke A., Theil F., Levitas V.I.** Universität Hannover, Preprint A8, 1998, 30 P. (5)
- [372] A study of a Hamiltonian System for Phase Transitions with Microkinetic Energy. **Theil F., Levitas V.I.** Universität Hannover, Preprint A5, 1998, 28 P.
- [373] Mikromechanik von Plastizität und Phasenumwandlungen. Unterlagen zur Vorlesung. **Levitas V.I.** Universität Hannover. Institut für Baumechanik und Numerische Mechanik, IBNM-Bericht 96/2, 1996, 80 P. (In German).
- [374] Investigation of Mechanical Properties and Phase Transformations of Materials in Diamond Anvils Under Compression and Shear. Report of research project 1145. **Novikov N.V., Levitas V.I.** (project leaders) **et al.** Kiev, Institute for Superhard Materials, 1996, 75 P. (In Russian).
- [375] Design and Investigation of a High Pressure Apparatus with Steel Matrix for the Synthesis of Large Monocrystalline Diamonds. Report of research project 9.03.05/142-94 of State Scientific-Technical Program "New Materials". **Novikov N.V., Levitas V.I.** (project leaders), **et al.** Kiev, Institute for Superhard Materials. 1996, 146 P. (In Russian).
- [376] Thermodynamische Phasenumwandlungstheorie und eine Aehnlichkeit zur Plastizitaetstheorie. **Levitas V.I.** Universität Hannover. Institut für Baumechanik und Numerische Mechanik, IBNM-Bericht 91/5, 1995, 45 P. (In German).
- [377] Development of a Thermomechanical Model for the Description of the Process of Diamond Crystallization in a Metal-Carbon Solution System. Report of research project 7.04.02/080-92 of State Scientific-Technical Program "New Materials". **Novikov N.V., Levitas V.I.** (project leaders), **et al.** Kiev, Institute for Superhard Materials. 1994, 57 P. (In Russian).
- [378] Development of an Improved Model for the Description of the Process of Diamond Crystals Synthesis in High Pressure Apparatus. Report of research project 1138. **Novikov N.V., Levitas V.I.** (project leaders) **et al.** Kiev, Institute for Superhard Materials. 1994, 110 P. (In Russian).
- [379] Computer Design of the Components of High Pressure Apparatus for Superhard Materials Synthesis. Report of research project 1146. **Novikov N.V., Levitas V.I.** (project leaders) **et al.** Kiev, Institute for Superhard Materials. 1994, 74 P. (In Russian).
- [380] Post-bifurcation Behaviour in Finite Elastoplasticity. Applications to Strain Localization and Phase Transitions. **Levitas V.I.** Universität Hannover. Institut für Baumechanik und Numerische Mechanik, IBNM-Bericht 92/5. 1992, 107 P.



- [381] Development of a Mathematical Model of Stressed-Strained State of Structurally Heterogeneous Materials under Large Irreversible Deformations, High Pressure and Phase Transitions. Report of research project 1131. **Novikov N.V., Levitas V.I.** (project leaders) **et al.** Kiev, Institute for Superhard Materials. 1992, 107 P. (In Russian).
- [382] Investigation of the Mechanical State and Development of the Force Components Of an Apparatus, Working at Megabar Pressure. Report of research project 0734. **Levitas V.I.** (subproject leader) **et al.** Kiev, Institute for Superhard Materials. 1991, 107 P. (In Russian).
- [383] Optimization of the Value of Axial Interference for the New Method of Press-Fitting with The Aim of Increasing of the Durability Of A Block-Matrix For Diamond Synthesis On 15% . Report of technical project 3031. **Levitas V.I.** (project leader) **et al.** Kiev, Institute for Superhard Materials. 1991, 28 P. (In Russian).
- [384] Development of Thermomechanical Models for the Heat Treatment and Carburizing of Steel. Report of research project 0037. **Levitas V.I.** (project leader). Kiev, Firm "Strength", 1991, 47 P. (In Russian).
- [385] Development and Organization of the Production of a High Pressure Apparatus of the Cylindrical Type for the Synthesis Of Monocrystalline Diamonds with A Volume Exceeding 25 sm<sup>3</sup>. Report of research project 0170. **Levitas V.I.** (subproject leader) **et al.** Kiev, Institute for Superhard Materials. 1989, 269 P. (In Russian).
- [386] Development and Organization of the Production of a High Pressure Apparatus with Reaction Volume 30-40 sm<sup>3</sup> for Synthesis of Heat Resistant Monocrystalline Diamonds and Other Superhard Materials. Report of research project 0169. **Levitas V.I.** (subproject leader) **et al.** Kiev, Institute for Superhard Materials. 1989, 255 P. (In Russian).
- [387] Development and Industrial Installation of the Technological Process of Press-Fitting of Cemented Carbide Matrix of High Pressure Apparatus with the Aim Of Increasing Their Durability On 25 % At Diamond Synthesis. Report of technical project 2717. **Levitas V.I.** (project leader) **et al.** Kiev, Institute for Superhard Materials. 1989, 101 P. (In Russian).
- [388] Increasing of the Screening Effect of Thin Aluminium Vacuum Condensates on a Organic Film Backing by Producing of Finite Strains under Hydrostatic Pressure 0.1-10 Kbar. Report of technical project 2264. **Levitas V.I.** (project leader) **et al.** Kiev, Institute for Superhard Materials. 1988, 97 P. (In Russian).
- [389] Development and Industrial Testing of Technology of Press-Fitting of Cemented Carbide Matrix of High Pressure Apparatus with the Aim of Increasing Their Durability. Report of technical project 2508. **Levitas V.I.** (project leader) **et al.** Kiev, Institute for Superhard Materials. 1988, 95 P. (In Russian).
- [390] Development of Methods of Quality Control of Container of High Pressure Apparatuses Made from Steel. Report of technical project 2451. **Levitas V.I.** (project leader) **et al.** Kiev, Institute for Superhard Materials. 1988, 42 P. (In Russian).
- [391] Experimental and Numerical Study of Large Elastoplastic Deformations of Materials under High Pressure. Report of research project 0168. **Novikov N.V., Levitas V.I.** (project leaders) **et al.** Kiev, Institute for Superhard Materials. 1988, Vol. 2, 244 P. (In Russian).

- [392] Development of Fundamentals of the Theory of Large Elastoplastic Deformations of Materials under High Pressure. Report of research project 0168. **Novikov N.V., Levitas V.I.** (project leaders). Kiev, Institute for Superhard Materials. 1988, Vol. 1, 228 P. (In Russian).
- [393] Development of Mathematical Models of Behaviour of Materials, Used in the Structures of Cryogenic Machinebuilding. Report of technical project 2384. **Levitas V.I.** (project leader), **Idesman A.V.** Kiev, Institute for Superhard Materials. 1987, 66 P. (In Russian).
- [394] Investigation of Peculiarities of Control of Thermodynamical Parameters at Diamond Single Crystals Synthesis. Report of research project 0162. **Levitas V.I.** (subproject leader) **et al.** Kiev, Institute for Superhard Materials. 1986, 193 P. (In Russian).
- [395] Development and Installation of the System of Research Automatization in the Fields of Development of New Technologies and Tool Design at the Institute for Superhard Materials. Report of research project 0158. **Levitas V.I.** (subproject leader) **et al.** Kiev, Institute for Superhard Materials. 1984, 153 P. (In Russian).
- [396] Determination of Mechanical Properties of Materials, Used in High Pressure Apparatuses; Calculations of Strength of Apparatuses. Report of technical project 1707. **Novikov N.V., Maystrenko A.L., Levitas V.I. et al.** Kiev, Institute for Superhard Materials. 1982, 160 P. (In Russian).
- [397] Investigation of Physical and Mechanical Properties of Superhard Materials and Development of the Methods of Their Testing in the Industrial Conditions. Report of research project 1117. **Novikov N.V., Maystrenko A.L., Levitas V.I. et al.** Kiev, Institute for Superhard Materials. 1982, 213 P. (In Russian).

#### **Deposited manuscripts (In Russian)**

- [398] Flow Theory for a Two-Phase Composite. **Levitas V.I.** Kiev, 1988. Deposited in VINITI 23.02.88, No. 1407-B-88, 30 P.
- [399] Constitutive Relations for Complex Media at Finite Strains. Communication 2. **Levitas V.I.** Kiev, 1987. Deposited in VINITI 15.12.87, No. 8746, 26 P.
- [400] Constitutive Relations for Complex Media at Finite Strains. Communication 1. **Levitas V.I.** Kiev, 1987. Deposited in VINITI 15.12.87, No. 8745, 34 P.
- [401] Constitutive Equations for Elastoplastic Materials. Communication 3. Complete Model of Thermo-Elastoplastic Materials with Anisotropic Hardening under High Hydrostatic Pressure. **Levitas V.I.** Kiev. 1985. Deposited in VINITI 3.10.85, No. 7020-B-85, 38 P.
- [402] Constitutive Equations for Elastoplastic Materials. Communication 2. Rate Equations for Anisotropic and Isotropic Materials. **Levitas V.I.** Kiev, 1985. Deposited in VINITI 3.10.85, No. 7019-B-85, 26 P.
- [403] Constitutive Equations for Elastoplastic Materials. Communication 1. Kinematics. Analog of Il'yshin's Elastoplastic Processes Theory. **Levitas V.I.** Kiev, 1985. Deposited in VINITI 3.10.85, No. 7018-B-85, 39 P.

- [404] Decomposition of Total Strain Measures on Components at Finite Strains. Communication 2. Three-Dimensional Elastoplastic Strain. **Levitas V.I.** Kiev, 1985. Deposited in VINITI 2.07.85, No. 4747-85 Dep., 28 P.
- [405] Decomposition of Total Strain Measures on Components at Finite Strains. Communication 1. Uniaxial Elastoplastic Strain. **Levitas V.I.** Kiev, 1985. Deposited in VINITI 2.07.85, No. 4746-85 Dep., 20 P.
- [406] On Objectivity of Constitutive Equations, Containing Time Derivative of Various Tensors. **Levitas V.I.** Kiev, 1984. Deposited in VINITI 16.10.84, No. 6738-84 Dep., 28 P.
- [407] Some Postulates of the Large Elastoplastic Strain Theory under High Pressure. **Levitas V.I.** Kiev, 1983. Deposited in VINITI 21.02.83, No. 931-83 Dep., 23 P.
- [408] The Fundamentals of the Theory of Anisotropic Systems and its Application to Mechanics and Physics. **Levitas V.I.** Kiev, 1977. Deposited in UkrNIINTI No. 733 DR, 19 P.

#### USSR and Ukraine Patents (Inventor's Certificates), in Russian

- [409] High Pressure Apparatus. **Shvedov L.K., Novikov N. V., Levitas V.I., Krivosheya Ju.N.** Ukraine Patent I.c. No. 4681, 17.01.2005, Bul. No. 1, 3 P.
- [410] Method of Charging of Surface by Abrasive Grains. **Levitas V.I., Makovetskiy V.V., Rusakov V.I.** I.c. No. 1738620. Register of inventions, 1992, No. 21, 5 P.
- [411] Device for Compression of Specimens. **Hvan D.V., Levitas V.I., Lagunov V.S., Polyakov E.S., Hrapov V.V.** I.c. No. 1745492. Register of inventions, 1992, No. 25, 3 P.
- [412] Method of Charging of Surface by Abrasive Grains. **Makovetskiy V.V., Levitas V.I., Nemetz V.M.** I.c. No. 1738621. Register of inventions, 1992, No. 21, 4 P.
- [413] Assembling Method for Details with Conical Coupling Surfaces by Press-Fitting. **Levitas V.I., Nemirovskiy Ya.B., Petrenko V.I., Nemirovskiy A.B., Stashkevich I.E., Idesman A.V., Gerovskiy A.I., Udov A.A., Zhrebtsov Y.V., Nepopushev N.I., Golenko A.I.** I.c. No. 1579699. Register of inventions, 1990, No. 27, 5 P.
- [414] High Pressure Apparatus. **Gerasimovich A.V., Shishkin V.A., Levitas V.I.** I.c. No. 1522523, 1989, 3 P.
- [415] Method of Materials Limit Hardness Determination. **Rosenberg A.M., Levitas V.I., Rosenberg O.A., Nemirovskiy Ya.B., Krivosheya V.V., Chernyavskiy A.V., Nemirovskiy A.B., Stashkevich I.E.** I.c. No. 1422108. Register of inventions, 1988, No. 33, 3 P.
- [416] Device for Testing of Long Specimens in Plastic Compression. **Hvan D.V., Lagunov V.S., Levitas V.I., Nemirovskiy A.B.** I.c. No. 1411624. Register of inventions, 1988, No. 27, 4 P.
- [417] Piston-Cylinder-Type Device for Tension-Compression Testing of Specimens Mainly at High Hydrostatic Pressure and Temperature. **Novikov N.V., Levitas V.I., Nemirovskiy A.B., Ryapov A.P.** I.c. No. 1241089. Register of inventions, No. 24, 1986, 4 P.

- [418] Cylindrical Insert for Rock Drilling Tools. **Rosenberg A.M., Krivosheya V.V., Levitas V.I., Nemirovskiy Ya.B., Rosenberg O.A., Sveshnikov I.A., Zabolotniy S.D., Vasil'ev V.I.** I.c. No. 11686995. Register of inventions, 1985, No. 7, 3 P.
- [419] Abrasive Tool and Method of Its Producing. **Novikov N.V., Borisenko N.S., Suprunenko V.V., Prudnikov E.L., Levitas V.I.** I.c. No. 1002141. Register of inventions, 1983, No. 9, 4 P.