# Shengping Shen

List of Publications by Year
in descending order

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|---|---|---|---|
| 134 papers | 3,289 citations | 159585 30 h-index | 197818 49 g-index |
| 135 all docs | 135 docs citations | 135 times ranked | 1378 citing authors |

| # | Article | IF | Citations |
|---|---|---|---|
| 1 | A theory of flexoelectricity with surface effect for elastic dielectrics. Journal of the Mechanics and Physics of Solids, 2010, 58, 665-677. | 4.8 | 369 |
| 2 | Effects of surface and flexoelectricity on a piezoelectric nanobeam. Smart Materials and Structures, 2014, 23, 035020. | 3.5 | 130 |
| 3 | Variational principles and governing equations in nano-dielectrics with the flexoelectric effect. Science China: Physics, Mechanics and Astronomy, 2010, 53, 1497-1504. | 5.1 | 124 |
| 4 | Electromechanical responses of piezoelectric nanoplates with flexoelectricity. Acta Mechanica, 2015, 226, 3097-3110. | 2.1 | 91 |
| 5 | Size-dependent buckling and vibration behaviors of piezoelectric nanostructures due to flexoelectricity. Smart Materials and Structures, 2015, 24, 105012. | 3.5 | 89 |
| 6 | SIZE-DEPENDENT PIEZOELECTRICITY AND ELASTICITY DUE TO THE ELECTRIC FIELD-STRAIN GRADIENT COUPLING AND STRAIN GRADIENT ELASTICITY. International Journal of Applied Mechanics, 2013, 05, 1350015. | 2.2 | 75 |
| 7 | Flexoelectret: An Electret with a Tunable Flexoelectriclike Response. Physical Review Letters, 2019, 122, 148001. | 7.8 | 74 |
| 8 | Mixed Finite Elements for Flexoelectric Solids. Journal of Applied Mechanics, Transactions ASME, 2017, 84, . | 2.2 | 69 |
| 9 | Effect of flexoelectricity on electrostatic potential in a bent piezoelectric nanowire. Smart Materials and Structures, 2012, 21, 115024. | 3.5 | 62 |
| 10 | Improved approach to measure the direct flexoelectric coefficient of bulk polyvinylidene fluoride. Journal of Applied Physics, 2016, 119, . | 2.5 | 61 |
| 11 | The basis of meshless domain discretization: the meshless local Petrov?Galerkin (MLPG) method. Advances in Computational Mathematics, 2005, 23, 73-93. | 1.6 | 60 |
| 12 | Interface crack in bi-piezothermoelastic media and the interaction with a point heat source. International Journal of Solids and Structures, 1998, 35, 3899-3915. | 2.7 | 53 |
| 13 | Nanoscale mechanical energy harvesting using piezoelectricity and flexoelectricity. Smart Materials and Structures, 2017, 26, 035050. | 3.5 | 53 |
| 14 | A Timoshenko dielectric beam model with flexoelectric effect. Meccanica, 2016, 51, 1181-1188. | 2.0 | 50 |
| 15 | The impact of flexoelectricity on materials, devices, and physics. Journal of Applied Physics, 2020, 128, . | 2.5 | 50 |
| 16 | An active control model of laminated piezothermoelastic plate. International Journal of Solids and Structures, 1999, 36, 1925-1947. | 2.7 | 48 |
| 17 | Non-equilibrium thermodynamics and variational principles for fully coupled thermalâ€“mechanicalâ€“chemical processes. Acta Mechanica, 2013, 224, 2895-2910. | 2.1 | 47 |
| 18 | A new Bernoulliâ€“Euler beam model based on a simplified strain gradient elasticity theory and its applications. Composite Structures, 2014, 111, 317-323. | 5.8 | 47 |

| # | Article | IF | Citations |
|---|---|---|---|
| 19 | Buckling and vibration of flexoelectric nanofilms subjected to mechanical loads. Journal Physics D: Applied Physics, 2016, 49, 115307. | 2.8 | 46 |
| 20 | Flexoelectric energy harvesters based on Timoshenko laminated beam theory. Journal of Intelligent Material Systems and Structures, 2017, 28, 2064-2073. | 2.5 | 46 |
| 21 | General approach on chemistry and stress coupling effects during oxidation. Journal of Applied Physics, 2013, 114, . | 2.5 | 44 |
| 22 | Shear flexoelectric coefficient Î¼1211 in polyvinylidene fluoride. Journal of Applied Physics, 2015, 117, . | 2.5 | 43 |
| 23 | Bernoulliâ€“Euler Dielectric Beam Model Based on Strain-Gradient Effect. Journal of Applied Mechanics, Transactions ASME, 2013, 80, . | 2.2 | 39 |
| 24 | Stabilizing mechanism of single-atom catalysts on a defective carbon surface. Npj Computational Materials, 2020, 6, . | 8.7 | 38 |
| 25 | A curved resonant flexoelectric actuator. Applied Physics Letters, 2017, 111, . | 3.3 | 37 |
| 26 | Love waves in layered flexoelectric structures. Philosophical Magazine, 2017, 97, 3186-3209. | 1.6 | 36 |
| 27 | On the large-strain plasticity of silicon nanowires: Effects of axial orientation and surface. International Journal of Plasticity, 2012, 38, 146-158. | 8.8 | 35 |
| 28 | A flexoelectricity effect-based sensor for direct torque measurement. Journal Physics D: Applied Physics, 2015, 48, 485502. | 2.8 | 33 |
| 29 | Reactionâ€“Diffusionâ€“Stress Coupling Effect in Inelastic Oxide Scale During Oxidation. Oxidation of Metals, 2015, 83, 507-519. | 2.1 | 33 |
| 30 | Investigation of the 2312 flexoelectric coefficient component of polyvinylidene fluoride: Deduction, simulation, and mensuration. Scientific Reports, 2017, 7, 3134. | 3.3 | 33 |
| 31 | Measuring the flexoelectric coefficient of bulk barium titanate from a shock wave experiment. Journal of Applied Physics, 2017, 122, . | 2.5 | 33 |
| 32 | Surface effects on the post-buckling of piezoelectric nanowires. Physica E: Low-Dimensional Systems and Nanostructures, 2015, 69, 61-64. | 2.7 | 32 |
| 33 | A Three-Dimensional Mixed Finite Element for Flexoelectricity. Journal of Applied Mechanics, Transactions ASME, 2018, 85, . | 2.2 | 32 |
| 34 | Lamb wave propagation with flexoelectricity and strain gradient elasticity considered. Smart Materials and Structures, 2018, 27, 085003. | 3.5 | 32 |
| 35 | Dynamical theoretical model and variational principles for coupled temperatureâ€“diffusionâ€“mechanics. Acta Mechanica, 2012, 223, 29-41. | 2.1 | 31 |
| 36 | Wave Propagation in Flexoelectric Microstructured Solids. Journal of Elasticity, 2018, 130, 197-210. | 1.9 | 31 |

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|---|---|---|---|
| 37 | The flexodynamic effect on nanoscale flexoelectric energy harvesting: a computational approach. Smart Materials and Structures, 2018, 27, 105001. | 3.5 | 30 |
| 38 | Electromechanical analysis of direct and converse flexoelectric effects under a scanning probe tip. Journal of the Mechanics and Physics of Solids, 2020, 142, 104020. | 4.8 | 30 |
| 39 | Shear flexoelectric response along 3121 direction in polyvinylidene fluoride. Applied Physics Letters, 2015, 107, . | 3.3 | 29 |
| 40 | Rayleigh wave propagation in a homogeneous centrosymmetric flexoelectric half-space. Ultrasonics, 2020, 103, 106105. | 3.9 | 26 |
| 41 | DynamicJintegral, separated dynamicJintegral and component separation method for dynamic interfacial cracks in piezoelectric bimaterials. International Journal of Fracture, 2003, 122, 101-130. | 2.2 | 25 |
| 42 | A Fully Coupled Theory and Variational Principle for Thermalâ€“Electricalâ€“Chemicalâ€“Mechanical Processes. Journal of Applied Mechanics, Transactions ASME, 2014, 81, . | 2.2 | 25 |
| 43 | Experimental method research on transverse flexoelectric response of poly(vinylidene fluoride). Japanese Journal of Applied Physics, 2016, 55, 071601. | 1.5 | 25 |
| 44 | Effect of Flexoelectricity on Band Structures of One-Dimensional Phononic Crystals. Journal of Applied Mechanics, Transactions ASME, 2014, 81, . | 2.2 | 24 |
| 45 | The research of effective flexoelectric coefficient along 1123 direction in polyvinylidene fluoride. Journal of Applied Physics, 2017, 121, . | 2.5 | 22 |
| 46 | Stability of stacking fault tetrahedron in twin boundary bicrystal copper under shear. International Journal of Plasticity, 2017, 97, 246-258. | 8.8 | 22 |
| 47 | Multiscale analysis of the effects of nanocavity on nanoindentation. Computational Materials Science, 2009, 46, 425-430. | 3.0 | 21 |
| 48 | Energetics of point defect interacting with grain boundaries undergone plastic deformations. International Journal of Plasticity, 2016, 85, 93-109. | 8.8 | 21 |
| 49 | Experimental and numerical investigations on the tensile behavior of 3D random fibrous materials at elevated temperature. Composite Structures, 2017, 160, 292-299. | 5.8 | 21 |
| 50 | Athermal Shape Memory Effect in Magnetoactive Elastomers. ACS Applied Materials & Interfaces, 2020, 12, 16930-16936. | 8.0 | 21 |
| 51 | Effects of voidâ€“crack interaction and void distribution on crack propagation in single crystal silicon. Engineering Fracture Mechanics, 2015, 146, 56-66. | 4.3 | 20 |
| 52 | Revisiting the structures and energies of silicon ã€ˆ110ã€‰ symmetric tilt grain boundaries. Journal of Materials Research, 2019, 34, 1021-1033. | 2.6 | 20 |
| 53 | Interface crack problems of a laminated piezoelectric plate. European Journal of Mechanics, A/Solids, 1999, 18, 219-238. | 3.7 | 19 |
| 54 | Coupling diffusionâ€“reactionâ€“mechanics model for oxidation. Acta Mechanica, 2015, 226, 3375-3386. | 2.1 | 19 |

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| 55 | On band structures of layered phononic crystals with flexoelectricity. Archive of Applied Mechanics, 2018, 88, 629-644. | 2.2 | 19 |
| 56 | Forced vibration of piezoelectric and flexoelectric Eulerâ€“Bernoulli beams by dynamic Greenâ€™s functions. Acta Mechanica, 2021, 232, 449-460. | 2.1 | 18 |
| 57 | Converse flexoelectricity with relative permittivity gradient. Applied Physics Letters, 2019, 114, . | 3.3 | 17 |
| 58 | An actuation method by a biconcave beam structure with converse flexoelectric effect. Smart Materials and Structures, 2019, 28, 115025. | 3.5 | 17 |
| 59 | Analytical solution for one-dimensional coupled non-Fick diffusion and mechanics. Archive of Applied Mechanics, 2013, 83, 397-411. | 2.2 | 16 |
| 60 | Interaction of voids and nano-ductility in single crystal silicon. Computational Materials Science, 2013, 67, 123-132. | 3.0 | 16 |
| 61 | Investigations on the compressive behavior of 3D random fibrous materials at elevated temperatures. Ceramics International, 2017, 43, 5195-5203. | 4.8 | 16 |
| 62 | Conservation laws and path-independent integrals in mechanical-diffusion-electrochemical reaction coupling system. Journal of the Mechanics and Physics of Solids, 2017, 104, 57-70. | 4.8 | 15 |
| 63 | Residual Stress Analysis Due to Chemomechanical Coupled Effect, Intrinsic Strain and Creep Deformation During Oxidation. Oxidation of Metals, 2015, 84, 413-427. | 2.1 | 14 |
| 64 | Nonhysteretic superelasticity and strain hardening in a copper bicrystal with a â˜3{112} twin boundary. Acta Materialia, 2017, 124, 30-36. | 7.9 | 14 |
| 65 | High-temperature nanoindentation for temperature-dependent mechanical behavior of enamel coating. Surface and Coatings Technology, 2019, 374, 541-548. | 4.8 | 14 |
| 66 | Tunable Flexoelectricity of Elastomers. Journal of Physical Chemistry C, 2020, 124, 24429-24434. | 3.1 | 14 |
| 67 | Flexoelectric Energy Harvesting Using Circular Thin Membranes. Journal of Applied Mechanics, Transactions ASME, 2020, 87, . | 2.2 | 14 |
| 68 | Effect of surface roughness on elastic limit of silicon nanowires. Computational Materials Science, 2015, 101, 267-274. | 3.0 | 13 |
| 69 | Electrochemomechanics with flexoelectricity and modelling of electrochemical strain microscopy in mixed ionic-electronic conductors. Journal of Applied Physics, 2016, 120, 065102. | 2.5 | 13 |
| 70 | Flexoelectricity in pyramid compression: decoupling from effective to intrinsic. Journal Physics D: Applied Physics, 2020, 53, 125302. | 2.8 | 13 |
| 71 | Inverse Flexoelectret Effect: Bending Dielectrics by a Uniform Electric Field. Physical Review Applied, 2021, 15, . | 3.8 | 13 |
| 72 | Facilitating electrocatalytic hydrogen evolution via multifunctional tungsten@tungsten disulfide coreâ€“shell nanospheres. Journal of Materials Chemistry A, 2021, 9, 9272-9280. | 10.3 | 13 |

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|---|---|---|---|
| 73 | Effects of small indenter size and its position on incipient yield loading during nanoindentation. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2009, 526, 211-218. | 5.6 | 12 |
| 74 | Probing flexoelectricity via a split Hopkinson pressure bar experiment. Applied Physics Letters, 2018, 112, . | 3.3 | 12 |
| 75 | Chemo-mechanical coupling effect in the high-temperature oxidation of metal materials: A review. Science China Technological Sciences, 2019, 62, 1246-1254. | 4.0 | 12 |
| 76 | Path-independent integrals in electrochemomechanical systems with flexoelectricity. International Journal of Solids and Structures, 2018, 147, 20-28. | 2.7 | 11 |
| 77 | Coupled chemomechanical theory with strain gradient and surface effects. Acta Mechanica, 2018, 229, 133-147. | 2.1 | 11 |
| 78 | Size-dependent stability of stacking fault tetrahedron in coherent twin boundary bicrystal: Comparisons among Al, Ni, Cu and Ag. Computational Materials Science, 2018, 155, 256-265. | 3.0 | 11 |
| 79 | Decoupled shear flexoelectric effects in polymers. Journal of Applied Physics, 2019, 125, . | 2.5 | 11 |
| 80 | Edge dislocations interacting with a Î£11 symmetrical grain boundary in copper upon mixed loading: A quasicontinuum method study. Computational Materials Science, 2017, 137, 162-170. | 3.0 | 11 |
| 81 | Effect of electrostatic force on a piezoelectric nanobeam. Smart Materials and Structures, 2012, 21, 015001. | 3.5 | 10 |
| 82 | Adhesion properties of Cu(111)/Î±-quartz (0001) interfaces: A molecular dynamics study. Materials Science & Engineering A: Structural Materials: Properties, Microstructure and Processing, 2017, 695, 239-248. | 5.6 | 10 |
| 83 | Radiation response of nanotwinned Cu under multiple-collision cascades. Journal of Nuclear Materials, 2018, 505, 183-192. | 2.7 | 10 |
| 84 | A Fully Coupled Chemomechanical Formulation With Chemical Reaction Implemented by Finite Element Method. Journal of Applied Mechanics, Transactions ASME, 2019, 86, . | 2.2 | 10 |
| 85 | Structure and shear response of <001> tilt grain boundary in titanium nitride. Ceramics International, 2019, 45, 5531-5546. | 4.8 | 10 |
| 86 | Initial dislocation topologies of nanoindentation into copper (001) film with a nanocavity. Engineering Fracture Mechanics, 2010, 77, 3329-3340. | 4.3 | 9 |
| 87 | Energetics of point defect interacting with bi-crystal Î£3 copper grain boundaries. Computational Materials Science, 2016, 118, 47-55. | 3.0 | 9 |
| 88 | Fracture toughness of random fibrous materials with ultrahigh porosity at elevated temperatures. Journal of the American Ceramic Society, 2018, 101, 1323-1332. | 3.8 | 9 |
| 89 | Investigations on fracture toughness and fracture surface energy of 3D random fibrous materials at elevated temperatures. Engineering Fracture Mechanics, 2018, 190, 288-298. | 4.3 | 9 |
| 90 | Experimental decoupling of cylindrical flexoelectric coefficients. Applied Physics Letters, 2018, 113, . | 3.3 | 9 |

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|---|---|---|---|
| 91 | Temperature dependence of flexoelectric coefficient for bulk polymer polyvinylidene fluoride. Journal Physics D: Applied Physics, 2019, 52, 075302. | 2.8 | 9 |
| 92 | Tailoring the nanostructures of electrochemical actuators for fast response and large deformation. Nanoscale, 2020, 12, 15643-15651. | 5.6 | 9 |
| 93 | Experimental approach for measuring cylindrical flexoelectric coefficients. Journal of Applied Physics, 2017, 122, . | 2.5 | 8 |
| 94 | Shear response of grain boundary bicrystals with a stacking fault tetrahedron. Computational Materials Science, 2018, 147, 137-144. | 3.0 | 8 |
| 95 | Response of <110> symmetric tilt grain boundary in titanium nitride under shear. Engineering Analysis With Boundary Elements, 2019, 105, 231-241. | 3.7 | 8 |
| 96 | A novel evaluation of fracture toughness for random fibrous material. Composite Structures, 2020, 243, 112179. | 5.8 | 8 |
| 97 | Effect of crystallization on the macro and micro residual stress of enamel coating. Journal of the European Ceramic Society, 2021, 41, 3643-3654. | 5.7 | 8 |
| 98 | Giant flexoelectric response via mechanical and material design in elastomers. Mechanics of Materials, 2022, 165, 104186. | 3.2 | 8 |
| 99 | Impact interfacial fracture for piezoelectric ceramic. Mechanics Research Communications, 1999, 26, 347-352. | 1.8 | 7 |
| 100 | A Chemomechanical Model for Stress Evolution and Distribution in the Viscoplastic Oxide Scale During Oxidation. Journal of Applied Mechanics, Transactions ASME, 2016, 83, . | 2.2 | 7 |
| 101 | A Finite Element Implementation of a Fully Coupled Mechanicalâ€“Chemical Theory. International Journal of Applied Mechanics, 2017, 09, 1750040. | 2.2 | 7 |
| 102 | Numerical analysis for a crack in piezoelectric material under impact. International Journal of Solids and Structures, 2007, 44, 8457-8492. | 2.7 | 6 |
| 103 | Fracture of Î²-SiC bulk with a void of different shapes under different loading modes. Engineering Fracture Mechanics, 2017, 181, 29-37. | 4.3 | 6 |
| 104 | An ABAQUS implementation of electrochemomechanical theory for mixed ionic electronic conductors. Solid State Ionics, 2018, 319, 34-45. | 2.7 | 6 |
| 105 | Porosity Effects on Mechanical Properties of 3D Random Fibrous Materials at Elevated Temperatures. Acta Mechanica Solida Sinica, 2020, 33, 14-30. | 1.9 | 6 |
| 106 | Diversity of transverse flexoelectricity in non-poled polyvinylidene fluoride. Journal of Applied Physics, 2020, 128, . | 2.5 | 6 |
| 107 | Flexoelectricity in periodically poled lithium niobate by PFM. Journal Physics D: Applied Physics, 2022, 55, 335303. | 2.8 | 6 |
| 108 | Chemomechanical analysis for interfacial reactions between Î³â€TiAl alloy and glassâ€ceramic coating in micro/nano scale. Journal of the American Ceramic Society, 2018, 101, 5675-5683. | 3.8 | 5 |

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| 109 | Highâ€temperature shortâ€range compressive responses and contact effect of ultrahigh porosity 3D random fibrous materials. Journal of the American Ceramic Society, 2018, 101, 4509-4518. | 3.8 | 5 |
| 110 | Decoupling method of flexoelectric coefficient tensor components in non-polarized polyvinylidene fluoride. Journal Physics D: Applied Physics, 2020, 53, 325303. | 2.8 | 5 |
| 111 | Mechanical tunability of flexoelectricity in elastomers. Applied Physics Letters, 2021, 119, . | 3.3 | 5 |
| 112 | Dynamic mechanical behaviour of three-dimensional random fibrous materials at high temperatures. Composite Structures, 2021, 276, 114593. | 5.8 | 5 |
| 113 | A chemomechanical coupling model for stress analysis of oxide scale growing between ceramic coating and substrate. Acta Mechanica, 2017, 228, 3173-3183. | 2.1 | 4 |
| 114 | Ferroelectric-like hysteresis loops induced by chemical reaction and flexoelectricity in electrochemical strain microscopy measurements. Journal of Applied Physics, 2018, 124, 085116. | 2.5 | 4 |
| 115 | Strain-modulated early stage oxidation of Fe films. Journal of Applied Physics, 2019, 125, . | 2.5 | 4 |
| 116 | An electro-mechanical behavior enhancement method: geometric design with flexoelectricity. Smart Materials and Structures, 2019, 28, 025024. | 3.5 | 4 |
| 117 | Diversifying temporal responses of magnetoactive elastomers. Materials Research Express, 2020, 7, 045702. | 1.6 | 4 |
| 118 | Nonlinear electrochemomechanical modelling of electrochemical strain microscopy imaging. Nanotechnology, 2020, 31, 315704. | 2.6 | 4 |
| 119 | Dynamic analysis of Bernoulli-Euler piezoelectric nanobeam with electrostatic force. Science China: Physics, Mechanics and Astronomy, 2013, 56, 1930-1937. | 5.1 | 3 |
| 120 | Fully Coupling Chemomechanical Yield Theory Based on Evolution Equations. International Journal of Applied Mechanics, 2016, 08, 1650058. | 2.2 | 3 |
| 121 | A chemomechanical coupling model for oxidation and stress evolution in ZrB2â€“SiC. Journal of Materials Research, 2017, 32, 1267-1278. | 2.6 | 3 |
| 122 | Shear response of Î² -SiC bulk dependent on temperature and strain rate. Acta Mechanica Solida Sinica, 2017, 30, 137-144. | 1.9 | 3 |
| 123 | Strain hardening and embrittlement of Al crystal with a surface oxidized void. Mechanics of Materials, 2020, 148, 103531. | 3.2 | 3 |
| 124 | Statistical analysis on nanostructureâ€“mechanical property relations for xSiO2â€“(1-x)Al2O3 aluminosilicate glass with voids and inclusions. Ceramics International, 2021, 47, 29584-29597. | 4.8 | 3 |
| 125 | Flexoelectricity in non-oriented liquids. Journal Physics D: Applied Physics, 2021, 54, 06LT01. | 2.8 | 3 |
| 126 | Mechanical design of uniform strain-gradient schemes for transverse and longitudinal flexoelectricity. International Journal of Solids and Structures, 2022, 238, 111414. | 2.7 | 3 |

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| 127 | Electrochemomechanical Modeling and In Situ Measurement of Transition Metal Dichalcogenides-Based Electrochemical Actuators. Journal of the Electrochemical Society, 2020, 167, 167514. | 2.9 | 2 |
| 128 | An enhanced flexoelectric dielectric elastomer actuator with stretchable electret. Smart Materials and Structures, 2021, 30, 125004. | 3.5 | 2 |
| 129 | Transient Continuum Mechanics and Chemomechanics. Journal of Applied Mechanics, Transactions ASME, 2022, 89, . | 2.2 | 2 |
| 130 | Strain-modulated initial oxidation of Al(1-)Ni alloy surface. Applied Surface Science, 2022, 592, 153294. | 6.1 | 2 |
| 131 | Measuring the Gradient of Sound Pressure Directly Via Flexoelectricity. Physical Review Applied, 2022, 17, . | 3.8 | 2 |
| 132 | Analytical Solution for 2D Non-Fickian Transient Mass Transfer With Arbitrary Initial and Periodic Boundary Conditions. Journal of Heat Transfer, 2013, 135, . | 2.1 | 1 |
| 133 | Analysis of flexochemical effect and its application in scanning probe microscopy. Journal Physics D: Applied Physics, 0, , . | 2.8 | 1 |
| 134 | Temperature effect on dynamic compression performance of random fibrous composites in the TTT and IP directions. Journal of the European Ceramic Society, 2022, 42, 2400-2407. | 5.7 | 0 |