

Negative capacitance in multidomain ferroelectric superlattices

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Citation Report

#	ARTICLE	IF	CITATIONS
1	Negative Capacitance Behavior in a Leaky Ferroelectric. IEEE Transactions on Electron Devices, 2016, 63, 4416-4422.	1.6	108
2	Decrease in the double layer capacitance by faradaic current. RSC Advances, 2017, 7, 22501-22509.	1.7	36
3	Negative permittivity adjusted by SiO ₂ -coated metallic particles in percolative composites. Journal of Alloys and Compounds, 2017, 725, 1259-1263.	2.8	64
4	Origin of stationary domain wall enhanced ferroelectric susceptibility. Physical Review B, 2017, 95, .	1.1	15
5	Efficient systematic scheme to construct second-principles lattice dynamical models. Physical Review B, 2017, 95, .	1.1	23
6	Bilayer Polymer Metacomposites Containing Negative Permittivity Layer for New High- <i>k</i> Materials. ACS Applied Materials & Interfaces, 2017, 9, 1793-1800.	4.0	105
7	New insight into the structural evolution of PbTiO ₃ : an unbiased structure search. Physical Chemistry Chemical Physics, 2017, 19, 1420-1424.	1.3	5
8	Negative capacitance transients in metal-ferroelectric Hf _{0.5} Zr _{0.5} O ₂ -Insulator-Semiconductor (MFIS) capacitors. , 2017, , .		2
9	Negative permeability in magnetostatics and its experimental demonstration. Physical Review B, 2017, 96, .	1.1	12
10	Static negative capacitance of a ferroelectric nano-domain nucleus. Applied Physics Letters, 2017, 111, .	1.5	19
11	Evaluation of Negative Capacitance Ferroelectric MOSFET for Analog Circuit Applications. IEEE Transactions on Electron Devices, 2017, 64, 4317-4321.	1.6	70
12	Operando hard X-ray photoelectron spectroscopy study of the Pt/Ru/PbZr _{0.52} Ti _{0.48} O ₃ interface. Applied Physics Letters, 2017, 111, .	1.5	13
13	Transient nature of negative capacitance in ferroelectric field-effect transistors. Solid State Communications, 2017, 265, 12-14.	0.9	22
14	Terahertz-Range Polar Modes in Domain-Engineered BiFeO_3 Physical Review Letters, 2017, 119, 057604.	2.9	15
15	Phase coexistence and electric-field control of toroidal order in oxide superlattices. Nature Materials, 2017, 16, 1003-1009.	13.3	159
16	On the persistence of polar domains in ultrathin ferroelectric capacitors. Journal of Physics Condensed Matter, 2017, 29, 284001.	0.7	14
17	Nanoscale design of polarization in ultrathin ferroelectric heterostructures. Nature Communications, 2017, 8, 1419.	5.8	80
18	Voltage Drop in a Ferroelectric Single Layer Capacitor by Retarded Domain Nucleation. Nano Letters, 2017, 17, 7796-7802.	4.5	66

#	ARTICLE	IF	CITATIONS
19	A phononic switch based on ferroelectric domain walls. <i>Physical Review B</i> , 2017, 96, .	1.1	39
20	Stable charged antiparallel domain walls in hyperferroelectrics. <i>Journal of Physics Condensed Matter</i> , 2017, 29, 244003.	0.7	10
21	Modeling and design considerations for negative capacitance field-effect transistors. , 2017, , .		22
22	Quantum paraelectricity probed by superconducting resonators. <i>Physical Review B</i> , 2017, 95, .	1.1	8
23	Unexpectedly high Curie temperature in weakly strained ferroelectric film. <i>Physica Status Solidi (B): Basic Research</i> , 2017, 254, 1600413.	0.7	3
24	Negative capacitance field effect transistors; capacitance matching and non-hysteretic operation. , 2017, , .		23
25	Differential voltage amplification from ferroelectric negative capacitance. <i>Applied Physics Letters</i> , 2017, 111, .	1.5	36
26	Polar nature of stress-induced twin walls in ferroelastic CaTiO ₃ . <i>AIP Advances</i> , 2017, 7, 085315.	0.6	22
27	A Thermodynamic Perspective of Negative-Capacitance Field-Effect Transistors. <i>IEEE Journal on Exploratory Solid-State Computational Devices and Circuits</i> , 2017, 3, 56-64.	1.1	28
28	Experimental Observation and Simulation Model for Transient Characteristics of Negative-Capacitance in Ferroelectric HfZrO ₂ Capacitor. <i>IEEE Journal of the Electron Devices Society</i> , 2018, 6, 346-353.	1.2	35
29	Time-Resolved Measurement of Negative Capacitance. <i>IEEE Electron Device Letters</i> , 2018, 39, 272-275.	2.2	74
30	Effect of hysteretic and non-hysteretic negative capacitance on tunnel FETs DC performance. <i>Nanotechnology</i> , 2018, 29, 095202.	1.3	32
31	Emergent chirality in the electric polarization texture of titanate superlattices. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2018, 115, 915-920.	3.3	121
32	Domain Wall Orientations in Ferroelectric Superlattices Probed with Synchrotron X-Ray Diffraction. <i>Physical Review Letters</i> , 2018, 120, 037602.	2.9	16
33	Steep-slope hysteresis-free negative capacitance MoS ₂ transistors. <i>Nature Nanotechnology</i> , 2018, 13, 24-28.	15.6	422
34	Physical Origin of Transient Negative Capacitance in a Ferroelectric Capacitor. <i>Physical Review Applied</i> , 2018, 9, .	1.5	66
35	Fabrication and electrical investigations of PbTiO ₃ ceramics with Pb/Ti contents through solid state sintering reaction method. <i>Materials Chemistry and Physics</i> , 2018, 214, 8-16.	2.0	8
36	Analytic methods for solving the cylindrical nonlinear Maxwell equations. <i>Optik</i> , 2018, 170, 287-294.	1.4	2

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37	Multidomain Phase-Field Modeling of Negative Capacitance Switching Transients. IEEE Transactions on Electron Devices, 2018, 65, 295-298.	1.6	17
38	Single Atomic Layer Ferroelectric on Silicon. Nano Letters, 2018, 18, 241-246.	4.5	26
39	Subthreshold Behavior of MFMS and MFIS Transistors caused by Ferroelectric Polarization Switching. , 2018, , .		1
40	Demonstration of High-speed Hysteresis-free Negative Capacitance in Ferroelectric Hf _{0.5} Zr _{0.5} O ₂ . , 2018, , .		45
41	Nanocrystal-Embedded-Insulator Ferroelectric Negative Capacitance FETs with Sub-kT/q Swing. IEEE Electron Device Letters, 2018, , 1-1.	2.2	14
42	Meta-composites: NiO supported 3D carbon networks structured by 1D building blocks towards tailorable negative permittivity. Journal of Materials Science: Materials in Electronics, 2018, 29, 18815-18827.	1.1	1
43	Perspective: Emergent topologies in oxide superlattices. APL Materials, 2018, 6, 100901.	2.2	28
44	Role of gate current and polarization switching in sub-60 mV/decade steep subthreshold slope in metal-ferroelectric HfZrO ₂ -metal-insulator-Si FET. Japanese Journal of Applied Physics, 2018, 57, 114202.	0.8	1
45	On the stabilization of ferroelectric negative capacitance in nanoscale devices. Nanoscale, 2018, 10, 10891-10899.	2.8	110
46	Electric control of the heat flux through electrophononic effects. Physical Review B, 2018, 97, .	1.1	25
47	Ferroelectric negative capacitance domain dynamics. Journal of Applied Physics, 2018, 123, .	1.1	72
48	Electrodynamics of ferroelectric films with negative capacitance. Physical Review B, 2018, 98, .	1.1	40
49	Local Structural Heterogeneity and Electromechanical Responses of Ferroelectrics: Learning from Relaxor Ferroelectrics. Advanced Functional Materials, 2018, 28, 1801504.	7.8	260
50	Probing Ferroic States in Oxide Thin Films Using Optical Second Harmonic Generation. Applied Sciences (Switzerland), 2018, 8, 570.	1.3	47
51	Control of misfit strain in ferroelectric BaTiO ₃ thin-film capacitors with SrRuO ₃ -based electrodes on (Ba, Sr)TiO ₃ -buffered SrTiO ₃ substrates. Applied Physics Letters, 2018, 113, 012903.	1.5	10
52	Extrinsic permittivity in domain engineered rhombohedral BaTiO ₃ monocrystal. Journal of Applied Physics, 2018, 124, 024101.	1.1	1
53	Steep slope negative capacitance FDSOI MOSFETs with ferroelectric HfYO _x . , 2018, , .		1
54	Effects of the Variation of V_{GS} Sweep Range on the Performance of Negative Capacitance FETs. IEEE Electron Device Letters, 2018, 39, 618-621.	2.2	20

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55	Ferroelectric Negative Capacitance Field Effect Transistor. <i>Advanced Electronic Materials</i> , 2018, 4, 1800231.	2.6	105
56	Nonvolatile Memory and Computing Using Emerging Ferroelectric Transistors. , 2018, , .		7
57	Subthreshold Behavior of Floating-Gate MOSFETs With Ferroelectric Capacitors. <i>IEEE Transactions on Electron Devices</i> , 2018, 65, 4641-4645.	1.6	10
58	Experimental Validation of Depolarization Field Produced Voltage Gains in Negative Capacitance Field-Effect Transistors. <i>IEEE Transactions on Electron Devices</i> , 2019, 66, 4419-4424.	1.6	26
59	Mechanisms to enhance the capacitance beyond the classical limits in capacitors with free-electron-like electrodes. <i>Physical Review B</i> , 2019, 99, .	1.1	1
60	A Unified Capacitive-Coupled Memristive Model for the Nonpinched Currentâ€“Voltage Hysteresis Loop. <i>Nano Letters</i> , 2019, 19, 6461-6465.	4.5	128
61	Negative Capacitance as Universal Digital and Analog Performance Booster for Complementary MOS Transistors. <i>Scientific Reports</i> , 2019, 9, 9105.	1.6	23
62	Revealing ferroelectric switching character using deep recurrent neural networks. <i>Nature Communications</i> , 2019, 10, 4809.	5.8	34
63	Positive non-linear capacitance: the origin of the steep subthreshold-slope in ferroelectric FETs. <i>Scientific Reports</i> , 2019, 9, 14957.	1.6	14
64	Negative Capacitance for Electrostatic Supercapacitors. <i>Advanced Energy Materials</i> , 2019, 9, 1901154.	10.2	50
65	Functional domain walls: Concepts and perspectives. <i>Solid State Physics</i> , 2019, , 133-142.	1.3	0
66	Giant Electrophononic Response in PbTiO_3 by Strain Engineering. <i>Physical Review Letters</i> , 2019, 123, 185901.	19.9	12
67	Electrifying skyrmion bubbles. <i>Nature</i> , 2019, 568, 322-323.	13.7	2
68	From the archive. <i>Nature</i> , 2019, 568, 323-323.	13.7	0
69	Functional Ferroic Domain Walls for Nanoelectronics. <i>Materials</i> , 2019, 12, 2927.	1.3	48
70	Design and Manipulation of Ferroic Domains in Complex Oxide Heterostructures. <i>Materials</i> , 2019, 12, 3108.	1.3	17
71	Ferroelectric memories. , 2019, , 393-441.		10
72	Thicknessâ€“Dependent Asymmetric Potential Landscape and Polarization Relaxation in Ferroelectric $\text{Hf}_x\text{Zr}_{1-x}\text{O}_2$ Thin Films through Interfacial Bound Charges. <i>Advanced Electronic Materials</i> , 2019, 5, 1900554.	2.6	13

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73	Modeling of Negative Capacitance in Ferroelectric Thin Films. <i>Advanced Materials</i> , 2019, 31, e1805266.	11.1	101
74	Negative capacitance from the inductance of ferroelectric switching. <i>Communications Physics</i> , 2019, 2, .	2.0	14
75	Transient negative capacitance and charge trapping in FDSOI MOSFETs with ferroelectric HfYOX. <i>Solid-State Electronics</i> , 2019, 159, 71-76.	0.8	7
76	Creating emergent phenomena in oxide superlattices. <i>Nature Reviews Materials</i> , 2019, 4, 257-268.	23.3	174
77	On the Physical Mechanism of Transient Negative Capacitance Effect in Deep Subthreshold Region. <i>IEEE Journal of the Electron Devices Society</i> , 2019, 7, 368-374.	1.2	28
78	A critical review of recent progress on negative capacitance field-effect transistors. <i>Applied Physics Letters</i> , 2019, 114, .	1.5	157
79	Ferroelectric negative capacitance. <i>Nature Reviews Materials</i> , 2019, 4, 243-256.	23.3	179
80	Negative Capacitance in HfO ₂ - and ZrO ₂ -Based Ferroelectrics. , 2019, , 473-493.		4
81	Time-resolved simulation of the negative capacitance stage emerging at the ferroelectric/semiconductor hetero-junction. <i>AIP Advances</i> , 2019, 9, 025037.	0.6	3
82	Dead layer thickness estimation at the ferroelectric film-metal interface in PZT. <i>Applied Physics Letters</i> , 2019, 114, .	1.5	12
83	Harnessing ferroelectric domains for negative capacitance. <i>Communications Physics</i> , 2019, 2, .	2.0	36
84	Nanoelectronics based on topological structures. <i>Nature Materials</i> , 2019, 18, 188-190.	13.3	61
85	Theoretical guidelines to create and tune electric skyrmion bubbles. <i>Science Advances</i> , 2019, 5, eaau7023.	4.7	59
86	Surface potential-Based Compact Model for Negative Capacitance FETs Compatible for Logic Circuit: with Time Dependence and Multidomain Interaction. , 2019, , .		5
87	Ferroelectrics, Negative Capacitance and Depolarization Field: What exactly is negative capacitance?. , 2019, , .		0
88	Transient Negative Capacitance of Silicon-doped HfO ₂ in MFMS and MFIS structures: experimental insights for hysteresis-free steep slope NC FETs. , 2019, , .		7
89	Why Do Ferroelectrics Exhibit Negative Capacitance?. <i>Materials</i> , 2019, 12, 3743.	1.3	16
90	Anisotropy-driven thermal conductivity switching and thermal hysteresis in a ferroelectric. <i>Applied Physics Letters</i> , 2019, 115, 192903.	1.5	8

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91	Demonstration of a Novel Ferroelectric-Dielectric Negative Capacitance Tunnel FET. , 2019, , .		2
92	Polymer matrix ferroelectric composites under pressure: Negative electric capacitance and glassy dynamics. European Physical Journal E, 2019, 42, 118.	0.7	4
93	Low-temperature sintering Graphene/CaCu ₃ Ti ₄ O ₁₂ nanocomposites with tunable negative permittivity. Journal of Alloys and Compounds, 2019, 771, 699-710.	2.8	73
94	Impact of Zirconium Doping on Steep Subthreshold Switching of Negative Capacitance Hafnium Oxide Based Transistors. Physica Status Solidi - Rapid Research Letters, 2019, 13, 1800573.	1.2	8
95	Negative Capacitance Transistors. Proceedings of the IEEE, 2019, 107, 49-62.	16.4	95
96	Unveiling the double-well energy landscape in a ferroelectric layer. Nature, 2019, 565, 464-467.	13.7	286
97	Spatially resolved steady-state negative capacitance. Nature, 2019, 565, 468-471.	13.7	245
98	Incomplete Dipoles Flipping Produced Near Hysteresis-Free Negative Capacitance Transistors. IEEE Electron Device Letters, 2019, 40, 329-332.	2.2	30
99	Negative capacitance switching in size-modulated Fe ₃ O ₄ nanoparticles with spontaneous non-stoichiometry: confronting its generalized origin in non-ferroelectric materials. Nanoscale, 2020, 12, 1528-1540.	2.8	18
100	Controllable Ferromagnetism in Super-tetragonal PbTiO ₃ through Strain Engineering. Nano Letters, 2020, 20, 881-886.	4.5	11
101	Direct Observation of Stable Negative Capacitance in SrTiO ₃ @BaTiO ₃ Heterostructure. Advanced Electronic Materials, 2020, 6, 1901005.	2.6	26
102	Negative capacitance regime in ferroelectrics demystified from nonequilibrium molecular dynamics. Physical Review B, 2020, 102, .	1.1	4
103	Ultrathin complex oxide nanomechanical resonators. Communications Physics, 2020, 3, .	2.0	24
104	On the applicability of Gibbs free energy landscape to the definition and understanding of transient negative capacitance in a ferroelectric capacitor. Journal Physics D: Applied Physics, 2020, 53, 455106.	1.3	2
105	Full Control of Polarization in Ferroelectric Thin Films Using Growth Temperature to Modulate Defects. Advanced Electronic Materials, 2020, 6, 2000852.	2.6	13
106	Recent Progress on Energy-Related Applications of HfO ₂ -Based Ferroelectric and Antiferroelectric Materials. ACS Applied Electronic Materials, 2020, 2, 2301-2317.	2.0	37
108	Polarization Switching and Negative Capacitance in Epitaxial $\text{Pb}(\text{Zr}_{1-x}\text{Ti}_x)\text{O}_3$ Thin Films. Physical Review Applied, 2020, 14, .		
109	Domain-wall engineering and topological defects in ferroelectric and ferroelastic materials. Nature Reviews Physics, 2020, 2, 634-648.	11.9	154

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110	Structural, dielectric and magnetic studies of (0 $\bar{1}$ 1 $\bar{1}$) type multiferroic (1-x)BaTi _{0.8} Sn _{0.2} O ₃ -(x)La _{0.5} Ca _{0.5} MnO ₃ (0 $\bar{1}$ 1 $\bar{1}$) composite ceramics. Journal of Materials Science: Materials in Electronics, 2020, 31, 19343-19354.		
111	Polar Morphologies from First Principles: PbTiO ₃ Films on SrTiO ₃ Substrates and the p(2 $\bar{1}$ - $\bar{1}$) Surface Reconstruction. Advanced Theory and Simulations, 2020, 3, 2000154.	1.3	11
112	What's next for negative capacitance electronics?. Nature Electronics, 2020, 3, 504-506.	13.1	42
113	Beyond Expectation: Advanced Materials Design, Synthesis, and Processing to Enable Novel Ferroelectric Properties and Applications. MRS Advances, 2020, 5, 3453-3472.	0.5	1
114	In-Memory Logic Operations and Neuromorphic Computing in Non-Volatile Random Access Memory. Materials, 2020, 13, 3532.	1.3	31
115	Strain control of layer-resolved negative capacitance in superlattices. Npj Computational Materials, 2020, 6, .	3.5	4
116	Effects of Interface Trap on Transient Negative Capacitance Effect: Phase Field Model. Electronics (Switzerland), 2020, 9, 2141.	1.8	6
117	Improved thin film growth using Slow Kinetics Intermittent Sputtering. Applied Surface Science, 2020, 516, 146077.	3.1	4
118	Enhanced transient negative capacitance during inhomogeneous ferroelectric switching. Physical Review B, 2020, 101, .	1.1	3
119	Effect of depolarization field on steep switching characteristics in negative capacitance field effect transistors. Semiconductor Science and Technology, 2020, 35, 085005.	1.0	2
120	Understanding of Polarization-Induced Threshold Voltage Shift in Ferroelectric-Gated Field Effect Transistor for Neuromorphic Applications. Electronics (Switzerland), 2020, 9, 704.	1.8	10
121	Fluorite-Structured Ferroelectric-/Antiferroelectric-Based Electrostatic Nanocapacitors for Energy Storage Applications. ACS Applied Energy Materials, 2020, 3, 6036-6055.	2.5	27
122	Negative dielectric behavior in tetragonal La _{0.8} Co _{0.2-x} EuxTiO ₃ (x=0.01-0.04) nanorods. Materials Characterization, 2020, 166, 110425.	1.9	18
123	Tunable negative permittivity of Bi ₂ O ₃ -SiO ₂ /MWCNT-glass-nanocomposites at radio frequency region. Journal of Materials Science: Materials in Electronics, 2020, 31, 11791-11800.	1.1	10
124	A microscopic ϵ -model of ferroelectric negative capacitance. , 2020, , .		2
125	Polar coupling enabled nonlinear optical filtering at MoS ₂ /ferroelectric heterointerfaces. Nature Communications, 2020, 11, 1422.	5.8	31
126	Interfacial Responsive Functional Oxides for Nanoelectronics. Springer Series in Materials Science, 2020, , 197-214.	0.4	1
127	Multi-Domain Negative Capacitance Effects in Metal-Ferroelectric-Insulator-Semiconductor/Metal Stacks: A Phase-field Simulation Based Study. Scientific Reports, 2020, 10, 10207.	1.6	50

#	ARTICLE	IF	CITATIONS
128	A comprehensive review on emerging artificial neuromorphic devices. Applied Physics Reviews, 2020, 7, .	5.5	417
129	Excellent Energy Storage Performance in Bilayer Composites Combining Aligned TiO ₂ Nanoarray and Random TiO ₂ Nanowires with Poly(vinylidene fluoride). Journal of Physical Chemistry C, 2020, 124, 2864-2871.	1.5	14
130	Universality and origin of ultrashort intrinsic negative dielectric permittivity. Physical Review B, 2020, 101, .	1.1	5
131	Physical Mechanisms of Reverse DIBL and NDR in FeFETs With Steep Subthreshold Swing. IEEE Journal of the Electron Devices Society, 2020, 8, 429-434.	1.2	17
132	Local negative permittivity and topological phase transition in polar skyrmions. Nature Materials, 2021, 20, 194-201.	13.3	86
133	Piezoelectric properties of ferroelectric perovskite superlattices with polar discontinuity. Computational Materials Science, 2021, 188, 110113.	1.4	5
134	Recent Progress on Topological Structures in Ferroic Thin Films and Heterostructures. Advanced Materials, 2021, 33, e2000857.	11.1	84
135	Strain-Induced Interlayer Parallel/Antiparallel Magnetic Transitions of Twisted Bilayers. Advanced Theory and Simulations, 2021, 4, 2000215.	1.3	2
136	Metal-ferroelectric supercrystals with periodically curved metallic layers. Nature Materials, 2021, 20, 495-502.	13.3	39
137	Energy-efficient transistors: suppressing the subthreshold swing below the physical limit. Materials Horizons, 2021, 8, 1601-1617.	6.4	28
138	Polarizing and depolarizing charge injection through a thin dielectric layer in a ferroelectric-dielectric bilayer. Nanoscale, 2021, 13, 2556-2572.	2.8	26
139	CH ₃ NH ₃ PbI ₃ as a radio frequency decoupling capacitor: interplay between Maxwell-Wagner polarization and a pseudo inductive response. Journal Physics D: Applied Physics, 2021, 54, 175105.	1.3	5
140	Tip-induced domain protrusion in ferroelectric films with in-plane polarization. Journal of Applied Physics, 2021, 129, 054103.	1.1	1
141	Progress and future prospects of negative capacitance electronics: A materials perspective. APL Materials, 2021, 9, .	2.2	79
142	Negative capacitance effects in ferroelectric heterostructures: A theoretical perspective. Journal of Applied Physics, 2021, 129, .	1.1	41
143	Anomalous Motion of Charged Domain Walls and Associated Negative Capacitance in Copper-Chlorine Boracite. Advanced Materials, 2021, 33, e2008068.	11.1	19
144	Exotic Quad-Domain Textures and Transport Characteristics of Self-Assembled BiFeO ₃ Nanoislands on Nb-Doped SrTiO ₃ . ACS Applied Materials & Interfaces, 2021, 13, 12331-12340.	4.0	8
145	Differential charge boost in hysteretic ferroelectric-dielectric heterostructure capacitors at steady state. Applied Physics Letters, 2021, 118, .	1.5	3

#	ARTICLE	IF	CITATIONS
146	Negative capacitance in epitaxial ferroelectric capacitors evidenced by dynamic dielectric characterization. <i>Materials Today Communications</i> , 2021, 26, 102076.	0.9	1
147	Strain engineering of ferroelectric negative capacitance in PbZr(1-)Ti O3 thin films. <i>Acta Materialia</i> , 2021, 206, 116607.	3.8	8
148	Ferroelectric polarization retention with scaling of Hf0.5Zr0.5O2 on silicon. <i>Applied Physics Letters</i> , 2021, 118, .	1.5	19
149	Thermodynamic equilibrium theory revealing increased hysteresis in ferroelectric field-effect transistors with free charge accumulation. <i>Communications Physics</i> , 2021, 4, .	2.0	2
150	Analysis of increase in forward transconductance to determine the critical point of polarization at ferroelectric 1T1C memory. <i>Applied Physics Letters</i> , 2021, 118, .	1.5	2
151	Insight into influence of thermodynamic coefficients on transient negative capacitance in Zr-doped HfO ₂ ferroelectric capacitors*. <i>Chinese Physics B</i> , 2021, 30, 127701.	0.7	1
152	Strongly enhanced and tunable photovoltaic effect in ferroelectric-paraelectric superlattices. <i>Science Advances</i> , 2021, 7, .	4.7	19
153	Condensation of collective polar vortex modes. <i>Physical Review B</i> , 2021, 103, .	1.1	10
154	Observation of negative capacitance in antiferroelectric PbZrO3 Films. <i>Nature Communications</i> , 2021, 12, 4215.	5.8	22
155	Ultra-thin ferroelectrics. <i>Materials Science and Engineering Reports</i> , 2021, 145, 100622.	14.8	41
156	Thermodynamic driving force of transient negative capacitance of ferroelectric capacitors. <i>Applied Physics Letters</i> , 2021, 119, .	1.5	2
157	Homogeneous versus Inhomogeneous Polarization Switching in PZT Thin Films: Impact of the Structural Quality and Correlation to the Negative Capacitance Effect. <i>Nanomaterials</i> , 2021, 11, 2124.	1.9	2
158	Structural Evidence for Ultrafast Polarization Rotation in Ferroelectric/Dielectric Superlattice Nanodomains. <i>Physical Review X</i> , 2021, 11, .	2.8	5
159	Study of multi-domain switching dynamics in negative capacitance FET using SPICE model. <i>Microelectronics Journal</i> , 2021, 115, 105186.	1.1	6
160	Freestanding Ferroelectric Bubble Domains. <i>Advanced Materials</i> , 2021, 33, e2105432.	11.1	18
162	Gate energy efficiency and negative capacitance in ferroelectric 2D/2D TFET from cryogenic to high temperatures. <i>Npj 2D Materials and Applications</i> , 2021, 5, .	3.9	16
163	Tuning Negative Capacitance in $\text{Pb}_{0.2}\text{Zr}_{0.8}\text{O}_{3-x}\text{O}_{3x}$ ferroelectric capacitors. <i>Physical Review Applied</i> , 2021, 16, .	1.1	9
164	Oxygen Vacancies Nucleate Charged Domain Walls in Ferroelectrics. <i>Physical Review Letters</i> , 2021, 127, 117601.	2.9	17

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165	Recent Advances in Negative Capacitance FinFETs for Low-Power Applications: A Review. IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, 2021, 68, 3056-3068.	1.7	20
166	Multilayer ceramic film capacitors for high-performance energy storage: progress and outlook. Journal of Materials Chemistry A, 2021, 9, 9462-9480.	5.2	46
167	Numerical Analysis of Gate-All-Around HfO ₂ /TiO ₂ /HfO ₂ High-K Dielectric Based WSe ₂ NCFET With Reduced Sub-Threshold Swing and High On/Off Ratio. IEEE Access, 2021, 9, 116254-116264.	2.6	6
168	Macroscopic and microscopic picture of negative capacitance operation in ferroelectric capacitors. Nanoscale, 2021, 13, 9641-9650.	2.8	20
169	Structural and electronic properties of monodomain ultrathin PbTiO ₃ /SrTiO ₃ /PbTiO ₃ /SrRuO ₃ heterostructures: A first-principles approach. Journal of Applied Physics, 2020, 128, .	1.1	6
170	A new era in ferroelectrics. APL Materials, 2020, 8, .	2.2	36
171	The pseudoatomic orbital basis: electronic accuracy and soft-mode distortions in ABO ₃ perovskites. Electronic Structure, 2020, 2, 025002.	1.0	2
172	Ferroelectric domain wall phonon polarizer. Physical Review Materials, 2017, 1, .	0.9	27
173	Dimensional control of defect dynamics in perovskite oxide superlattices. Physical Review Materials, 2018, 2, .	0.9	3
174	Domain structure and dielectric properties of metal-ferroelectric superlattices with asymmetric interfaces. Physical Review Materials, 2020, 4, .	0.9	6
175	<i>CADEM</i> : calculate X-ray diffraction of epitaxial multilayers. Journal of Applied Crystallography, 2017, 50, 288-292.	1.9	13
176	A Theoretical Study of Multidomain Ferroelectric Switching Dynamics With a Physics-Based SPICE Circuit Model for Phase-Field Simulations. IEEE Transactions on Electron Devices, 2020, 67, 2952-2959.	1.6	10
177	Wide and ultra-wide bandgap oxides: where paradigm-shift photovoltaics meets transparent power electronics. , 2018, , .		6
178	Giant polarization in super-tetragonal thin films through interphase strain. Science, 2018, 361, 494-497.	6.0	173
179	Low Voltage Operating 2D MoS ₂ Ferroelectric Memory Transistor with Hf _{1-x} Zr _x O ₂ Gate Structure. Nanoscale Research Letters, 2020, 15, 157.	3.1	31
180	Intrinsic Nature of Negative Capacitance in Multidomain Hf _{0.5} Zr _{0.5} O ₂ -Based Ferroelectric/Dielectric Heterostructures. Advanced Functional Materials, 2022, 32, 2108494.	7.8	30
182	Polar topological structures in ferroelectric materials. Wuli Xuebao/Acta Physica Sinica, 2020, 69, 127702.	0.2	5
183	Exact Long-Range Dielectric Screening and Interatomic Force Constants in Quasi-Two-Dimensional Crystals. Physical Review X, 2021, 11, .	2.8	14

#	ARTICLE	IF	CITATIONS
184	Interplay of domain structure and phase transitions: theory, experiment and functionality. <i>Journal of Physics Condensed Matter</i> , 2022, 34, 073002.	0.7	10
185	Engineering Strategies in Emerging Fluorite-Structured Ferroelectrics. <i>ACS Applied Electronic Materials</i> , 2022, 4, 1369-1380.	2.0	11
186	Electrostatics and domains in ferroelectric superlattices. <i>Royal Society Open Science</i> , 2020, 7, 201270.	1.1	12
187	Coexisting conventional and inverse mechanocaloric effects in ferroelectrics. <i>Physical Review B</i> , 2021, 104, .	1.1	1
188	Ferroelectric gate oxides for negative capacitance transistors. <i>MRS Bulletin</i> , 2021, 46, 930-937.	1.7	12
189	Performance analysis of nanowire and nanosheet NCFETs for future technology nodes. <i>Engineering Research Express</i> , 2021, 3, 045044.	0.8	1
190	Roadmap for Ferroelectric Domain Wall Nanoelectronics. <i>Advanced Functional Materials</i> , 2022, 32, 2110263.	7.8	45
191	Whither Steady-State Negative Capacitance of a Ferroelectric Film?. <i>SSRN Electronic Journal</i> , 0, , .	0.4	0
192	Negative capacitance devices: sensitivity analyses of the developed TCAD ferroelectric model for HZO. <i>Journal of Instrumentation</i> , 2022, 17, C01048.	0.5	2
193	Signatures of enhanced out-of-plane polarization in asymmetric BaTiO ₃ superlattices integrated on silicon. <i>Nature Communications</i> , 2022, 13, 265.	5.8	13
194	Frequency dependence on polarization switching measurement in ferroelectric capacitors. <i>Journal of Semiconductors</i> , 2022, 43, 014102.	2.0	10
195	Polar Chirality in BiFeO ₃ Emerging from A Peculiar Domain Wall Sequence. <i>Advanced Electronic Materials</i> , 2022, 8, .	2.6	7
196	Electrostatically Driven Polarization Flop and Strain-Induced Curvature in Free-Standing Ferroelectric Superlattices. <i>Advanced Materials</i> , 2022, 34, e2106826.	11.1	18
197	Mechanism for switchability in electron-doped ferroelectric interfaces. <i>Physical Review B</i> , 2022, 105, .	1.1	3
198	Negative Capacitance from the Inhomogenous Stray Field in a Ferroelectric-Dielectric Structure. <i>Advanced Functional Materials</i> , 2022, 32, .	7.8	11
199	Modeling of Ferroelectric Oxide Perovskites: From First to Second Principles. <i>Annual Review of Condensed Matter Physics</i> , 2022, 13, 325-364.	5.2	17
200	MOx in ferroelectric memories. , 2022, , 245-279.		0
201	High-density switchable skyrmion-like polar nanodomains integrated on silicon. <i>Nature</i> , 2022, 603, 63-67.	13.7	79

#	ARTICLE	IF	CITATIONS
202	The ferroelectric field-effect transistor with negative capacitance. Npj Computational Materials, 2022, 8, .	3.5	18
203	Negative Capacitance and Switching Dynamics Control Via Non-Ferroelectric Elements. ACS Applied Energy Materials, 2022, 5, 3307-3318.	2.5	0
204	Thin-Film Ferroelectrics. Advanced Materials, 2022, 34, e2108841.	11.1	33
205	Antiferroelectric negative capacitance from a structural phase transition in zirconia. Nature Communications, 2022, 13, 1228.	5.8	22
206	Domain Wall Acceleration by Ultrafast Field Application: An Ab Initio-Based Molecular Dynamics Study. Physica Status Solidi - Rapid Research Letters, 2022, 16, .	1.2	7
207	Ultrathin ferroic HfO ₂ -ZrO ₂ superlattice gate stack for advanced transistors. Nature, 2022, 604, 65-71.	13.7	108
208	Temperature Dependence of Dielectric Properties of Ferroelectric Heterostructures with Domain-Provided Negative Capacitance. Nanomaterials, 2022, 12, 75.	1.9	8
209	Surface charge mediated polar response in ferroelectric nanoparticles. Applied Physics Letters, 2021, 119, .	1.5	5
210	Positive-to-negative subthreshold swing of a MOSFET tuned by the ferroelectric switching dynamics of BiFeO ₃ . NPC Asia Materials, 2021, 13, .	3.8	3
211	Nitride perovskite becomes polar. Science, 2021, 374, 1445-1446.	6.0	4
212	TopoTEM: A Python Package for Quantifying and Visualizing Scanning Transmission Electron Microscopy Data of Polar Topologies. Microscopy and Microanalysis, 2022, , 1-9.	0.2	7
213	Optical second harmonic signature of phase coexistence in ferroelectric heterostructures. Physical Review B, 2022, 105, .		
214	TCAD numerical modeling of negative capacitance ferroelectric devices for radiation detection applications. Solid-State Electronics, 2022, 194, 108341.	0.8	2
215	Ferroelectric thin films: performance modulation and application. Materials Advances, 2022, 3, 5735-5752.	2.6	11
216	Observability of negative capacitance of a ferroelectric film: Theoretical predictions. Physical Review B, 2022, 105, .	1.1	2
217	Strain manipulation of ferroelectric skyrmion bubbles in a freestanding PbTiO ₃ film: A phase field simulation. Physical Review B, 2022, 105, .		
218	Physics and Modeling of Multidomain FeFET With Domain Wall-Induced Negative Capacitance. IEEE Transactions on Electron Devices, 2022, 69, 4659-4666.	1.6	7
219	Melting of crystals of polarization vortices and chiral phase transitions in oxide superlattices. Physical Review B, 2022, 105, .	1.1	5

#	ARTICLE	IF	CITATIONS
220	Dielectric properties of composites based on triglycine sulfate and nanocrystalline cellulose. <i>Ferroelectrics</i> , 2022, 591, 100-105.	0.3	1
221	Toward negative capacitance electronics. <i>Systematic Bioscience and Engineering</i> , 2022, 09, .	0.0	4
222	Negative capacitance regime in antiferroelectric PbZrO ₃ . <i>Journal of Applied Physics</i> , 2022, 132, .	1.1	0
223	Giant voltage amplification from electrostatically induced incipient ferroelectric states. <i>Nature Materials</i> , 2022, 21, 1252-1257.	13.3	4
224	Ferroelectric/paraelectric superlattices for energy storage. <i>Science Advances</i> , 2022, 8, .	4.7	14
225	High Velocity, Low Voltage Collective In-Plane Switching in (100) BaTiO ₃ Thin Films. <i>Advanced Science</i> , 2022, 9, .	5.6	4
226	Ultrafast Activation and Tuning of Topological Textures in Ferroelectric Nanostructures. <i>Advanced Electronic Materials</i> , 0, , 2200808.	2.6	4
227	Constructing an Overall Static Negative Capacitance Effect via Energy Landscape Designing. <i>Advanced Electronic Materials</i> , 2022, 8, .	2.6	1
228	Ferroelectric Devices for Intelligent Computing. , 2022, 2022, .		4
229	Electric field control of labyrinth domain structures in core-shell ferroelectric nanoparticles. <i>Physical Review B</i> , 2022, 106, .	1.1	1
230	Domain wall enabled steep slope switching in MoS ₂ transistors towards hysteresis-free operation. <i>Npj 2D Materials and Applications</i> , 2022, 6, .	3.9	4
231	Geometric defects induced by strain relaxation in thin film oxide superlattices. <i>Journal of Applied Physics</i> , 2022, 132, 185307.	1.1	0
232	Static structures and dynamic responses of polar topologies in oxide superlattices. <i>Applied Physics Letters</i> , 2022, 121, 212902.	1.5	1
233	Double S-shaped Polarization Voltage Curve and Negative Capacitance from Al ₂ O ₃ /Hf _{0.5} Zr _{0.5} O ₂ /Al ₂ O ₃ Triple-Layer Structure. <i>Advanced Functional Materials</i> , 2023, 33, .		3
234	Controlling the properties of PbTiO_3 superlattices by photoexcited carriers. <i>Physical Review B</i> , 2022, 106, .		
235	Stability of ferroelectric bubble domains. <i>Physical Review Materials</i> , 2023, 7, .	0.9	8
236	Observation of dielectric resonance and negative capacitance in 0.65Pb(Mg _{1/3} Nb _{2/3})O ₃ -0.35PbTiO ₃ textured thin films. <i>Scripta Materialia</i> , 2023, 227, 115272.	2.6	0
237	Quantitative study of EOT lowering in negative capacitance HfO ₂ /ZrO ₂ superlattice gate stacks. , 2022, , .		0

#	ARTICLE	IF	CITATIONS
238	Interface-related phenomena in epitaxial complex oxide ferroics across different thin film platforms: opportunities and challenges. <i>Materials Horizons</i> , 2023, 10, 1060-1086.	6.4	2
239	Current prospects and challenges in negative-capacitance field-effect transistors. <i>IEEE Journal of the Electron Devices Society</i> , 2023, , 1-1.	1.2	0
240	Creation and erasure of polar bubble domains in PbTiO ₃ films by mechanical stress and light illuminations. <i>Journal of Materiomics</i> , 2023, 9, 626-633.	2.8	2
241	Observation of center-type quad-domain structures in ordered BiFeO ₃ nanoisland arrays fabricated via mask-assisted pulsed laser deposition. <i>Journal of Applied Physics</i> , 2023, 133, 134103.	1.1	0
242	Direct Measurement of Negative Capacitance in Ferroelectric/Semiconductor Heterostructures. <i>ACS Applied Materials & Interfaces</i> , 2023, 15, 10175-10181.	4.0	1
243	A Novel Extended Back-Gate Negative Capacitance TFET for Improved Device Performance. , 2022, , .		0
244	Investigating the Reliability of a Negative Capacitance Field Effect Transistor Regarding the Electric Field Across the Oxide Layer. <i>Journal of Electronic Materials</i> , 2023, 52, 3180-3187.	1.0	1
245	Anomalous Optical Properties of KTN:Li Ferroelectric Supercrystals. <i>Nanomaterials</i> , 2023, 13, 899.	1.9	0
246	First-principles-based simulation of the electrocaloric effect. , 2023, , 63-91.		0
247	Electrocaloric effects in thin film structures. , 2023, , 225-244.		0
248	Two-Dimensional Nanocrystal Assemblies for Photocapacitive Devices. <i>ACS Applied Electronic Materials</i> , 2023, 5, 1770-1777.	2.0	0
249	Emergent Ferroelectric Switching Behavior from Polar Vortex Lattice. <i>Advanced Materials</i> , 2023, 35, .	11.1	4
250	Polar meron-antimeron networks in strained and twisted bilayers. <i>Nature Communications</i> , 2023, 14, .	5.8	9
251	Thermodynamics of Light-Induced Nanoscale Polar Structures in Ferroelectric Superlattices. <i>Nano Letters</i> , 2023, 23, 2551-2556.	4.5	2
252	Two-dimensional ferroelectrics from high throughput computational screening. <i>Npj Computational Materials</i> , 2023, 9, .	3.5	12
253	Enhanced Electrocaloric Response in Electrostatically Frustrated Ferroelectrics. <i>Physica Status Solidi - Rapid Research Letters</i> , 0, , .	1.2	0
254	Modular development of deep potential for complex solid solutions. <i>Physical Review B</i> , 2023, 107, .	1.1	4
255	Memcapacitive to Memristive Transition in Al/Y\$_{\text{ext}{2}}\$O\$_{\text{ext}{3}}\$/GZO Crossbar Array. <i>IEEE Transactions on Electron Devices</i> , 2023, , 1-6.	1.6	0

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256	Modeling of Ionizing Radiation Effects for Negative Capacitance Field-Effect Transistors. Coatings, 2023, 13, 798.	1.2	1
257	Topological phases in polar oxide nanostructures. Reviews of Modern Physics, 2023, 95, .	16.4	17