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Chi T.Q. Nguyen, Minh D. Nguyen, Hien T. Vu, Evert P. Houwman, Hung N. Vu, Guus Rijnders

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Chi T. Q. Nguyen [a], Minh D. Nguyen [a,b,c,*], Hien T. Vu [a], Evert P. Houwman [b], Hung N. Vu [a], and Guus Rijnders [b]

[a] International Training Institute for Materials Science (ITIMS), Hanoi University of Science and Technology, No. 1 Dai Co Viet road, Hanoi 10000, Vietnam

[b] MESA+ Institute for Nanotechnology, University of Twente, P.O. Box 217, 7500AE Enschede, The Netherlands

[c] Solmates B.V., Drienerlolaan 5, 7522NB Enschede, The Netherlands

* Corresponding author: minh.nguyen@itims.edu.vn

Abstract: Relaxor ferroelectric $Pb_{0.9}La_{0.1}(Zr_{0.52}Ti_{0.48})O_3$ (PLZT) thin films have been epitaxially grown via pulsed laser deposition on $SrRuO_3/SrTiO_3$ single crystal with different orientations. The high recoverable energy-storage density and energy-storage efficiency in the epitaxial PLZT thin films are mainly caused by the coexistence of relaxor and antiferroelectric-like behaviors. The recoverable energy-storage density of 12.03, 12.51 and 12.74 J/cm^3 and energy-storage efficiency of 86.50, 88.14 and 88.44%, respectively, for the PLZT(001), PLZT(011) and PLZT(111) thin films measured at 1000 kV/cm. The high energy density and high efficiency indicate that the relaxor epitaxial PLZT(111) thin film is a promising candidate for high pulsed power capacitors.

Keywords: *Relaxor ferroelectrics, epitaxial growth, orientation, energy storage.*