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The effect of epitaxial strain on interfaces between polar perovskites and SrTiO₃ MARK C. MONTI, CARL J. STOLLE, JOHN T. MARKERT, Physics Department, University of Texas at Austin — We have embarked on a systematic study of novel charge states at oxide interfaces. We have performed pulsed laser deposition (PLD) growth of epitaxial oxide thin films on single crystal oxide substrates. We plan to study the effects of epitaxial strain, of the termination layer, and of the metal oxide layers. We have successfully created TiO₂ terminated SrTiO₃ (STO) substrates and have grown epitaxial thin films of LaAlO₃ (LAO) on STO using a KrF pulsed excimer laser. Current work emphasizes the importance of understanding the effect of epitaxial strain on the metallic interface. We will study the effect of both lateral compression and stretching of the charged layered films on STO. We have made polycrystalline targets of LaGaO₃ and LaAlO₃ to study the effect of successively larger tensions as well as LaTiO₃ and KNbO₃ to examine the effect of compression on the films. Studying the effect of epitaxial strain and of the valence of the alternating layers of these films grown on STO will lead to a deeper understanding of charge doping and conduction at oxide interfaces. This work was supported by: Texas Advanced Research Program 003658-0126, The Robert A. Welch Foundation F-1191, and the National Science Foundation DMR-0605828.

Mark C. Monti
Physics Department, University of Texas at Austin

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