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Tailoring the electronic transitions of $NdNiO_3$ films through $(111)_{pc}$-oriented interfaces SARA CATALANO, University of Geneva, MARTA GIBERT, University of Geneva Switzerland, VALENTINA BISOGNI, SLS PSI Villigen Switzerland, FEIZHOU HE, RONNIE SUTARTO , CLS Saskatoon Canada, MICHEL VIRET, CEA CNRS Saclay France, PAVLO ZUBKO, JENNIFER FOWLIE, University of Geneva Switzerland, GEORGE A. SAWATZKY, UBC Vancouver Canada, THORSTEN SCHMITT, SLS PSI Villigen Switzerland, JEAN-MARC TRISCONE, University of Geneva Switzerland — Bulk $NdNiO_3$ displays a 1^{st} order metal to insulator transition (MIT) that occurs simultaneously with a paramagnetic to antiferromagnetic Néel transition. For $NdNiO_3$ epitaxial thin films grown along the $(001)_{pc}$ axis, the MIT can be tuned between 0 and 200K through a variety of parameters, such as epitaxial strain or electrostatic carrier doping. Here, we extend the control of the electronic transitions of $NdNiO_3$ thin films over an unprecedented temperature range by selecting $(111)_{pc}$-oriented substrates as a template for the growth. We show that $(111)_{pc}$ $NdNiO_3/NdGaO_3$ heterostructures exhibit a MIT above room temperature, at T=335K, and a Néel transition at T=230K. By comparing the behavior of $NdNiO_3$ layers grown on substrates with different symmetries and lattice parameters, we conclude that the particularly large tuning of the critical temperatures of the system is produced by the specific lattice matching conditions imposed along the $(111)_{pc}$ axis of orthorhombic substrates.

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