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Interface control of emergent ferroic order in Ruddlesden-Popper $\mathbf{Sr}_{n+1}\mathbf{Ti}_n\mathbf{O}_{3n+1}$ TURAN BIROL, NICOLE A. BENEDEK, CRAIG J. FENNIE, School of Applied & Engineering Physics, Cornell University — We have discovered from first-principles an unusual polar state in the low n $Sr_{n+1}Ti_nO_{3n+1}$ Ruddlesden-Popper (RP) layered perovskites in which ferroelectricity is nearly degenerate with antiferroelectricity, a relatively rare form of ferroic order. We show that epitaxial strain plays a key role in tuning the "perpendicular coherence length" of the ferroelectric mode, and does not induce ferroelectricity in these low dimensional RP materials as is well known to occur in $SrTiO_3$. These systems present an opportunity to manipulate the coherence length of a ferroic distortion in a controlled way, without disorder or a free surface. [T. Birol, N. A. Benedek, C. J. Fennie, Physical Review Letters, in press]

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