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$(\text{LaTiO}_3)_n/(\text{LaVO}_3)_n$ as a model system for unconventional charge transfer and polar metallicity YAKUI WENG, JUN-JIE ZHANG, BIN GAO, SHUAI DONG, Department of Physics, Southeast University — At interfaces between oxide materials, lattice and electronic reconstructions always play important roles in exotic phenomena. In this study, the density-functional theory and maximally localized Wannier functions are employed to investigate the $(\text{LaTiO}_3)_n/(\text{LaVO}_3)_n$ magnetic superlattices. By considering lattice distortion and dimensional effect, many interesting interfacial physics have been found in the $n = 1$ superlattice, e.g. magnetic phase transition, unconventional charge transfer, and metal-insulator transition. In addition, the compatibility among the polar structure, ferrimagnetism, and metallicity is predicted in the $n = 2$ superlattice.

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