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The onset of metallic behavior in strained $(LaNiO_3)_n/(SrMnO_3)_2$ superlattices STEVEN MAY, Materials Science Division, Argonne National Laboratory, TIFFANY SANTOS, Center for Nanoscale Materials, Argonne National Laboratory, ANAND BHATTACHARYA, Center for Nanoscale Materials and Materials Science Division, Argonne National Laboratory — Motivated by predictions of collective ordering phenomena in $LaNiO_3$, we have grown strained $(LaNiO_3)_n/(SrMnO_3)_2$ superlattices on $SrTiO_3$ using ozone-assisted molecular beam epitaxy. The superlattices exhibit excellent crystallinity and interfacial roughness of less than one unit cell. The samples undergo a metal-insulator transition as n is reduced from 4 to 2. Both $n = 1$ and 2 samples are insulating, however, they exhibit different transport behavior. The $n = 1$ sample acts as a gapped insulator, while the addition of a second LNO layer ($n = 2$) leads to hopping transport through non-gapped conduction channels. These results will be compared to $(LaMnO_3)/(SrMnO_3)$ superlattices to highlight how interfacial charge transfer differs in the nickelate/manganite superlattices from their all-manganite counterparts. Supported by the U.S. Department of Energy (DOE), Office of Basic Energy Sciences under contract DE-AC02-06CH11357.

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