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Conductivity Dynamics of the Metal-to-Insulator Transition in Nickelate Superlattices. VERNER THORSMOLLE, JINGDI ZHANG, University of California San Diego, SRIMANTA MIDDEY, University of Arkansas, ELSA ABREU, Swiss Federal Institute of Technology Zurich, GUFENG ZHANG, University of California San Diego, JAK CHAKHALIAN, University of Arkansas, RICHARD AVERITT, University of California San Diego — Complexity in transition metal oxides can be understood as a delicate balance between competing interactions, which give rise to an energy landscape whose details are not easily discerned. An increasingly successful approach to tackle this problem is that of time resolved experiments, where the fundamental timescales of the system properties can be investigated through their response to appropriately chosen femtosecond photoexcitation. Ultrafast optical studies of the insulator-metal transition (IMT) in transition metal oxides are of particular interest in terms of dynamics and control. The perovskite nickelates (RE)NiO_3 have emerged as an important class of IMT materials, exhibiting rich phenomena across the rare earth (RE) series that includes La, Pr, Nd, Sm, Eu, Y, and Lu. Quite recently, the growth of nickelate superlattices (SL) has been achieved, offering a route to control the IMT. Here, we will present the results of optical-pump THz-probe investigations of the IMT dynamics in these novel heterostructures.

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