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Nonlinear transport properties of model metal–Mott-insulator–metal heterostructures[1] SATOSHI OKAMOTO, Materials Science and Technology Division, Oak Ridge National Laboratory — Transport properties of heterostructures in which a finite number of correlated-insulator or correlated-metal layers are sandwiched by semi-infinite metallic leads are investigated by using the layer dynamical-mean-field method combined with the Keldysh Green's function technique. We use as impurity solvers the equation-of-motion decoupling method, the noncrossing approximation and the iteration perturbation method. Electron spectral functions in the interacting region are shown to evolve by an applied bias voltage. These effects control the current-voltage characteristics of the heterostructures. It is also shown that the deformed spectral functions strongly affect the optical response. These features differentiate a correlation-induced Mott insulator and a conventional band insulator.

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Satoshi Okamoto
Materials Science and Technology Division, Oak Ridge National Laboratory

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