Electronic Doping in Heterostructures of Strongly Correlated Materials

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Heterostructures of strongly correlated materials have attracted much attention recently. One of the main points of interest is the possibility of the stabilization of new phases at the interface between two different strongly correlated materials. In this talk, we present a study of the electronic properties of a heterostructure made of strongly correlated materials. The heterostructure is built up by alternating several layers of two different materials. The layers are thin enough (about 10 unit cells) so the charges can be transferred all throughout the heterostructure. Calculations are performed using the Density Matrix Renormalization Group algorithm together with a Poisson equation formalism to account for the charge redistribution produced by the interfaces.
We show that for realistic values of the parameters of the model the properties of the heterostructure are greatly determined by the behavior at the interfaces.