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Holon-Doublon Dynamics in Hubbard Ladders[1] LUIS DIAS DA SILVA, University of Sao Paulo, GONZALO ALVAREZ, Oak Rigde National Laboratory (ORNL), ELBIO DAGOTTO, University of Tennessee/ORNL — Studies of the dynamics of holon-doublon pairs in Mott insulators have unveiled interesting and contrasting results with their band-insulator counterparts [1,2]. In the 1D Hubbard model, a paradigm for a Mott insulator, numerical evidence suggests that the mechanism for exciton decay into magnetic excitations is inefficient [1]. However, transition metal oxides are usually grown in layered superlattices and a real-time study of the holon-doublon propagation on ladders and other layered structures is therefore needed. In this talk, we present results for the real-time dynamics of holon-doublon pairs propagating in a *two-leg* Hubbard ladder, a more realistic model for several SCMs. We use the time-dependent density matrix renormalization group (tDMRG) algorithm with a time-step-targetting Krylov method. We find that the ladder geometry changes the dynamics of the holon-doublon pair. A "transfer" of the excitation between the ladder legs is seen, depending on the ratio between the couplings in the two leg directions. Furthermore, the time decay of the total double occupation is modified in the ladder as compared to the 1D case.

[1] K.A. Al-Hassanieh et al., PRL **100** 166403 (2008).
[2] L. Dias da Silva et al., PRB **81** 125113 (2010).

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