A microscopic formulation of dynamical spin injection in ferro-magnetic heterostructures[1] AMIN AHMADI, EDUARDO MUCCIOLO, University of Central Florida — We present a novel microscopic formulation of dynamical spin injection from a ferromagnet (FM) into a two-dimensional nonmagnet (NM) material. The formulation employs a tight-binding Hamiltonian in the presence of a time-dependent boundary condition, which plays the role of FM region and models the hybridization at the FM-NM interface. The spin current expression is written in terms of Green's functions of the NM portion, allowing one to apply efficient recursive numerical methods for the computation of spin currents. In addition, both the atomic structure of the materials involved and the particular geometry of the system can be taken into account. Another advantage of the formulation is the possibility to include accurate, microscopic models of spin relaxation in the NM portion.

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