

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**A minimal TDDFT model for excitons**<sup>1</sup> YONGHUI LI, ZENGHUI YANG, CARSTEN ULLRICH, University of Missouri — Optical processes in insulators and semiconductors, including excitonic effects, can be accurately described with linear-response TDDFT, provided one uses suitable exchange-correlation kernels. We have developed a conceptually and computationally simple formalism for calculating exciton binding energies with TDDFT, based on a two-band approximation. This formalism is implemented in a one-dimensional Kronig-Penney model, and we discuss the requirements for excitonic binding in this model. The performance of different types of exchange-correlation kernels (long- versus short-ranged, adiabatic versus nonadiabatic) is analyzed, with a particular emphasis on the excitonic Rydberg series.

<sup>1</sup>This work is supported by NSF Grant DMR-1005651.

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Date submitted: 10 Nov 2011

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