Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Anomalous tunneling of bound pairs in crystal lattices PAVEL KORNILOVITCH, Hewlett-Packard Company, VLADIMIR BULATOV — A novel non-perturbative method of solving scattering problems for bound pairs on a lattice is developed. Two different break- ups of the Hamiltonian are employed to calculate the full Green operator and the wave function of the scattered pair. The calculation converges exponentially in the number of basis states used to represent the non-translationinvariant part of the Green operator. The method is general and applicable to a variety of scattering and tunneling problems. As the first application, the problem of pair tunneling through a weak link on a one-dimensional lattice is solved. It is found that at the momentum values close to π the pair tunnels much easier than one particle, with the transmission coefficient approaching unity. This anomalously high transmission is a consequence of the existence of a two-body resonant state localized at the weak link. [V.L. Bulatov and P.E. Kornilovitch, Europhys. Lett. **73**, 352 (2005).]

Pavel Kornilovitch
Hewlett-Packard Company

Date submitted: 30 Nov 2005 Electronic form version 1.4