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**Aaron Hoffman\*** ([ah1@math.bu.edu](mailto:ah1@math.bu.edu)), 111 Cummington St., Boston, MA 02215. *Scattering of solitary waves in the Fermi-Pasta-Ulam lattice.* Preliminary report.

We study the interaction of small amplitude, long wavelength solitary waves in the Fermi-Pasta-Ulam model with general nearest-neighbor interaction potential. We establish global-in-time existence and stability of counter-propagating solitary wave solutions. These solutions are close to the linear superposition of two solitary waves for large positive and negative values of time; for intermediate values of time these solutions describe the interaction of two counter-propagating pulses. These solutions are stable with respect to perturbations in  $\ell^2$  and asymptotically stable with respect to perturbations which decay exponentially at spatial  $\pm\infty$ . In addition, we establish the existence of asymptotic two-soliton states and report progress on the interaction of three or more waves. (Received July 27, 2009)