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CA 94720-3840. *Soliton evolution in the Hartree equation with slowly varying potential.*

We study the Hartree equation with a slowly varying smooth potential, $V(x) = W(hx)$, and with an initial condition which is ϵ away in H^1 norm from a soliton. We show that up to time $\log(1/h)/h$ and errors of size $\epsilon + h^2$ in H^1 , the solution is a soliton evolving according to the classical dynamics of a natural effective Hamiltonian, which we compute explicitly. This result is based on methods of Holmer-Zworski, who prove a similar theorem for the Gross-Pitaevskii equation, and on spectral estimates for the linearized Hartree operator recently obtained by Lenzmann. (Received February 28, 2009)