1136-35-120 **Aslihan Demirkaya*** (demirkaya@hartford.edu), West Hartford, CT 06119. ϕ^4 *Solitary Waves With a Parabolic Potential: Existence, Stability, and Collisional Dynamics.* Preliminary report.

We explore a ϕ^4 model with an added external parabolic potential term. This term dramatically alters the spectral properties of the system. We identify single and multiple kink solutions and examine their stability features; importantly, all of the stationary structures turn out to be unstable. We complement these with a dynamical study of the evolution of a single kink in the trap, as well as of the scattering of kink and anti-kink solutions of the model. We see that some of the key characteristics of kink-antikink collisions, such as the critical velocity and the multi-bounce windows highly depend on the trap strength parameter, as well as importantly also the initial displacement of the kink and antikink. (Received January 07, 2018)