

1107-35-297

Zhiwu Lin* (zlin@math.gatech.edu) and **Chongchun Zeng**. *Linear instability and invariant manifolds for Hamiltonian PDEs*. Preliminary report.

We will discuss a general framework to study instability of coherent states (traveling waves, standing waves, steady states etc) for general Hamiltonian PDEs with an energy functional bounded from below. First, an instability index theorem is obtained for the eigenvalues of the linearized problem. Then, it is used to prove the exponential trichotomy estimate for the linearized equation. Applications to construct invariant manifolds will be briefly discussed. Some examples include Gross-Pitaevskii equation for superfluids, generalized KDV and Boussinesq equations, and 2D Euler equation for ideal fluids. This is a joint work with Chongchun Zeng. (Received January 17, 2015)