1125-35-2052   **Zhiwu Lin*** (`zlin@math.gatech.edu`), **Jiayin Jin** and **Shasha Liao**. *Nonlinear modulatioal instability of dispersive wave models.*

Modulational instability (also called side band instability, Benjamin-Feir instability) is an important instability mechanism in lots of physical models, including 2D water waves and model equations such as KDV, BBM, and Whitham equations. It leads to the breakdown of periodic traveling wave pattern in these modes and the formation of stable structures such as envelope solitons. In the literature, such instability had been studied a lot from the linearized equation, i.e., the spectra of the linearized operator. With Shasha Liao and Jiayin Jin, we prove nonlinear modulational instability for lots of dispersive models including nonlinear Schrodinger equation, BBM, and KDV type equations (KDV, Benjamin-Ono, Whitham etc). The nonlinear instability is proved for both periodic and localized perturbations. The two main ingredients in the proof are: for the linear step, the semigroup estimates are obtained by using the Hamiltonian structures of the linearized PDEs; for the nonlinear step, the loss of derivative in the nonlinear term is overcome by the construction of higher order approximation solutions. (Received September 19, 2016)