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*Dynamics near solitons of the supercritical gKDV equations*

Consider generalized KDV equations with a power non-linearity  $(u^p)_x$ . These gKDV equations have solitary traveling waves, which are linearly unstable when  $p \geq 5$  (supercritical case). Jointly with Zhiwu Lin and Chongchun Zeng, we constructed invariant manifolds (stable, unstable and center) near the orbits of the unstable traveling waves in the energy space. In particular, the local uniqueness and orbital stability of the center manifold is obtained. These invariant manifolds give a complete classification of the dynamics near unstable traveling waves.