1135-35-352   **Mihaela Ifrim*** (`ifrim@wisc.edu`) and **John Hunter** (`hunter@math.ucdavis.edu`). *A normal form flow for two dimensional water waves.*

This article is concerned with the infinite depth water wave equations in two space dimensions. We consider this problem expressed in Eulerian coordinates. Viewing this problem as a quasilinear dispersive equation, we establish two results: (i) we produce a Hamiltonian flow which acts like a normal form that modifies the water wave equations into a new equivalent system with only cubic and higher order terms. (ii) further, using this idea, we establish local well-posedness and cubic lifespan bounds for solutions with small localized data. Neither of these results are new; they have been recently obtained by Wu, Alazard-Burq-Zuily, Hunter-Ifrim-Tataru using different coordinates and methods. Instead our goal is improve the understanding of this problem by providing a different approach for normal forms for water waves. (Received September 26, 2017)