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Birkhoff normal forms for water waves

Abstract: A normal forms transformation for a dynamical system in a neighborhood of a stationary point retains only the significant nonlinearities, eliminating inessential terms. It is well known that the equations for water waves can be posed as a Hamiltonian dynamical system, and that the equilibrium solution represents an elliptic stationary point. This talk will discuss the Birkhoff normal forms for this system of equations in the setting of spatially periodic solutions. Results include the regularity of the normal forms transformations, and the dynamical implications of the normal form. This is joint work with Catherine Sulem (University of Toronto).