

## **Stability of traveling water waves with a point vortex**

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In this talk, we will present recent results on the (conditional) orbital stability of two-dimensional steady capillary-gravity water waves with a point vortex. One can think of these waves as an idealization of traveling waves with compactly supported vorticity. The governing equations have a Hamiltonian formulation, and the waves themselves can be realized as minimizers of an energy subject to fixed momentum.

We are able to deduce stability by using an abstract framework that generalizes the classical work of Grillakis, Shatah, and Strauss. In particular, our theory applies to systems where the symplectic operator is state dependent and may fail to be surjective.

This is joint work with Kristoffer Varholm and Erik Wahlén.