Smooth and peaked waves in the reduced Ostrovsky equation

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Abstract

Reduced Ostrovsky equation is a shallow-water model for a rotating fluid. It exhibits both global smooth solutions and wave breaking in a finite time. I will show how both solutions arise in the Cauchy problem depending on the size of initial data. Another family of solutions consists of travelling periodic waves parameterized by the wave speed. Peaked wave is a terminal point in the family of smooth periodic waves. I will explain why the smooth periodic waves are spectrally stable whereas the limiting peaked wave is spectrally and linearly unstable in the time evolution of the reduced Ostrovsky equation.