Spectral instability of the peaked periodic wave in the reduced Ostrovsky equations

Anna Geyer[1,*], **Dmitry Pelinovsky**[2]

[1]*Delft Institute of Applied Mathematics, Delft University of Technology, The Netherlands*
[2]*Department of Mathematics and Statistics, McMaster University, Hamilton, Ontario, Canada*
[*]Email: `a.geyer@tudelft.nl`

The reduced Ostrovksy equation is a model for small-amplitude long waves in a rotating fluid. Peaked periodic waves of this equation are known to exist since the late 1970's. In this talk I will present recent results in which we answer the long standing open question whether these solutions are stable. We first prove linear instability of the peaked periodic waves using semi-group theory and energy estimates. Moreover, we show that the peaked wave is unique and that the equation does not admit Hölder continuous solutions, which implies that the reduced Ostrovsky equation does not admit cusps. Finally, we show that the peaked wave is also spectrally unstable and by so doing we discover a new instability phenomenon.