Geophysical Research Abstracts
Vol. 21, EGU2019-12037, 2019
EGU General Assembly 2019

Stabilizing the Peregrine soliton in deep water via damping due to wind gusts

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Analytical and numerical investigations of the Peregrine soliton, the lowest order rational solutions of the nonlinear Schrodinger equation, have shown that it is unstable [1]. The only instabilities of the Peregrine solution are the ones that are inherited from the instabilities of the underlying Stokes wave.
In this talk we examine how to suppress the effects of the modulational instability of the background state, thus effectively locally stabilizing the Peregrine solution. This is described in two contexts; in the development of spectral splitting schemes for numerical simulations of the Peregrine solution and in a deep water wave model which incorporates damping due to wind gusts.

[1] A. Calini, C.M. Schober and M. Strawn, Linear instability of the Peregrine breather: numerical and analytical investigations,
Appl. Num. Math., Published online (2018) . https://doi.org/10.1016/j.apnum.2018.11.005