Geophysical Research Abstracts
Vol. 16, EGU2014-1748, 2014
EGU General Assembly 2014

An approach to rogue waves through the cnoidal equation

Antonio Lechuga
CEDEX Ministry of Fomento, Head of the Coastal Department, Madrid, Spain (antonio.lechuga@cedex.es)

Lately it has been realized the importance of rogue waves in some events happening in open seas. Extreme waves and extreme weather could explain some accidents, but not all of them. Every now and then inflicted damages on ships only can be reported to be caused by anomalous and elusive waves, such as rogue waves. That's one of the reason why they continue attracting considerable interest among researchers.
In the frame of the Nonlinear Schrödinger equation(NLS), Witham(1974) and Dingemans and Otta (2001)gave asymptotic solutions in moving coordinates that transformed the NLS equation in a ordinary differential equation that is the Duffing or cnoidal wave equation.
Applying the Zakharov equation, Stiassnie and Shemer(2004) and Shemer(2010)got also a similar equation. It's well known that this ordinary equation can be solved in elliptic functions.
The main aim of this presentation is to sort out the domains of the solutions of this equation, that, of course, are linked to the corresponding solutions of the partial differential equations(PDEs). That being, Lechuga(2007),a simple way to look for anomalous waves as it's the case with some "chaotic" solutions of the Duffing equation.