Nat. Hazards Earth Syst. Sci. Discuss., 1, C1132–C1134, 2013
www.nat-hazards-earth-syst-sci-discuss.net/1/C1132/2013/

Natural Hazards and Earth System Sciences
Open Access
Discussions

Interactive comment on "Rogue waves in a wave tank: experiments and modeling" *by* A. Lechuga

A. Lechuga

antonio.lechuga@cedex.es

Received and published: 10 September 2013

In our paper we present the steady solution of the Ginzburg-Landau equation. Taking into account that the equation was not derived by water waves is not surprising that we find some problem with the involved parameters. Considering equation 1 fully dimensionless there is no difficulty to compare its solution with the generated wave train that can be made dimensionless also. The figure added to the previous reply was right, as can be seen in the figure added to this reply that is the same. Only that in the previous one I use ω to represent a function of the variable between brackets. To clarify it I have repeated the algebra without intermediate steps. In the present figure the equation (1), that is a Duffing equation can be seen as dimensional with n in meters, x in meters, σ in squared meters and ε in squared meters, or thoroughly dimensionless, as stated above

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 3201, 2013.

$$\frac{\partial u}{\partial t} - i\varepsilon^2 \frac{\partial^2 u}{\partial x^2} + u - i u^* - i u |u|^2 + i \sigma u = 0$$

$$u = n_1 + i n_2$$

$$u^* = n_1 - i n_2$$

$$\varepsilon^2 \frac{\partial^2 n_2}{\partial x^2} + n_1 - \sigma n_2 - n_2 + n_2 (n_1^2 + n_2^2) = 0$$

$$-\varepsilon^2 \frac{\partial^2 n_1}{\partial x^2} + n_2 - n_1 + \sigma n_1 - n_1 (n_1^2 + n_2^2) = 0$$

both identical if $n_1 = n_2 = n$

so,

$$-\varepsilon^2 \frac{\partial^2 n}{\partial x^2} + \sigma n - 2 n^3 = 0$$

and,

$$n = \frac{\sqrt{\sigma}}{ch\left(\frac{x\sqrt{\sigma}}{\varepsilon}\right)}$$

(getting rid of intermediate steps)

Fig. 1. Some algebra