Nat. Hazards Earth Syst. Sci. Discuss., 1, C2701–C2702, 2014
www.nat-hazards-earth-syst-sci-discuss.net/1/C2701/2014/

Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Non-linear water waves generated by impulsive motion of submerged obstacle" *by* N. I. Makarenko and V. K. Kostikov

Anonymous Referee #2

Received and published: 25 February 2014

The Authors report a theoretical study on water waves generated by the motion of a submerged obstacle. In particular, considering a moving elliptic obstacle, they are able to solve the differential equation modelling the system by using a complex velocity and a conformal map. Finally, they provide a small-time analytic solution obtained by using power series and discuss its different regimes.

The manuscript is well written and contains interesting mathematical and physical results and I recommend its publication in Natural Hazards and Earth System Sciences. However, in my opinion, the manuscript will be significantly improved if Authors could make some additional comments on the following point.

In equation (3) the Authors make the hypothesis that the fluid is irrotational: this is a

crucial hypothesis for the derivation of the model and its analytical results. However, the motion of the submerged obstacle can in principle generate vorticity (this may be the case in real experiments, or if analytically the Navier-Stokes equation is considered instead of the Euler equation). Comments on the physical limits which make the irrotational assumption valid could be provided (for example, the relation between the oscillating frequency of the object and the characteristic vortex shedding time?).

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 1, 7647, 2013.