Dispersive wave runup and some related amplification phenomena*

Denys Dutykh
CNRS – LAMA, University of Savoie, France

Dimitrios Mitsotakis
Institute for Mathematics and its Applications, University of Minnesota, USA

Frédéric Dias
School of Mathematical Sciences, University College Dublin, Ireland

Themistoklis Stefanakis
CMLA, École Normale Supérieure de Cachan, France

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Finite volume schemes are commonly used to construct approximate solutions to conservation laws. In this study we extend the framework of the finite volume methods to dispersive water wave models, in particular to Boussinesq type systems [3]. We focus mainly on the application of the method to bidirectional nonlinear, dispersive wave propagation in one space dimension. Special emphasis is given to important nonlinear phenomena such as solitary waves interactions, dispersive shock wave formation and the runup of breaking and non-breaking long waves [2]. Finally, we will assess the accuracy of several recently proposed analytical solutions [1] for the wave runup problem. Moreover, we will reveal some resonance-like phenomena during the wave runup which have not been yet known to our knowledge.

References

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