The scattering problem for Hamiltonian ABCD Boussinesq systems in the energy space

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© 2018 Elsevier Masson SASThe Boussinesq abcd system is a 4-parameter set of equations posed in Rt×Rx, originally derived by Bona, Chen and Saut [11,12] as first order 2-wave approximations of the incompressible and irrotational, two dimensional water wave equations in the shallow water wave regime, in the spirit of the original Boussinesq derivation [17]. Among many particular regimes, depending each of them in terms of the value of the parameters (a,b,c,d) present in the equations, the generic regime is characterized by the setting b,d>0 and a,c<0. If additionally b=d, the abcd system is Hamiltonian. The equations in this regime are globally well-posed in the energy space H1×H1, provided one works with small solutions [12]. In this paper, we investigate decay and the scattering problem in this regime, which is characterized as having (quadratic) long-range nonlinearities, very weak linear decay O(t?1/3) because of the one dimensional setting, and existence of non scattering solutions