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Residual jet formation due to head-on collision of very steep solitary waves

J. Chambarel (1), J. Touboul (2), and C. Kharif (1)

(1) Institut de Recherche sur les Phénomènes Hors Equilibre (IRPHE), Marseille, France (chambarel@irphe.univ-mrs.fr)(kharif@irphe.univ-mrs.fr), (2) Laboratoire de Sondages Electromagnétiques de l'Environnement Terrestre, Toulon, Francel (julien.touboul@univ-tln.fr)

A new phenomenon corresponding to the formation of a residual jet due to the head-on collision of two equal steep solitary waves is observed when the amplitude of the waves becomes larger than a critical threshold value. We run a series of numerical simulations based on a Boundary Integral Equation Method (BIEM) for different values of the non-linearity parameter a/h, where a is the amplitude of the initial solitary waves and h the water depth. The initial solitary waves are calculated numerically from the fully nonlinear equations. We calculate the acceleration at the free surface. We suggest the Rayleigh-Taylor instability to be a possible candidate at the origin of the residual jet formation.