

Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Breaking of waves in deep water¹ GERARDO RUIZ-CHAVARRIA,
Facultad de Ciencias, Universidad Nacional Autonoma de Mexico — The breaking of waves is a nonlinear phenomenon during which a fraction of the energy is dissipated. In the previous stage the wave undergoes a growth of its amplitude and the wave pattern is modified in the sense that the crests become more pronounced than the troughs. The breaking has been extensively studied in the case of waves approaching the shore. However, the wave breaking in deep water remains an open problem in fluid dynamics. In this work we study the wave breaking due to focusing of an initially parabolic wave front. To this end the evolution of wave is numerically investigated using a meshless code (Smoothed Particle Hydrodynamics). We present some results about the evolution of waves excited by a parabolic wave maker, among others, the growth induced by the focusing, the behavior around the Huygens' cusp and the process of wave breaking. Then, we compare the numerical results with the criteria given in the literature about the onset of breaking and we discuss how the energy dissipates, for example by the rise of short waves. In addition we compare the numerical results with data obtained in two different experiments made by our team.

¹Author acknowledges DGAPA-UNAM by support under project IN116312, "Vorticidad y ondas no lineales en fluidos."

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Date submitted: 02 Aug 2013

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