

Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Solitary water wave interactions in a wave channel JOSE ALBERTO MORALES¹, FC-UNAM, MARIA DEL CARMEN JORGE, PANAYIOTIS PANAYOTAROS, IIMAS-UNAM, RODOLFO SILVA, EDGAR MENDOZA, II-UNAM — Experimental research on the interaction of two co-propagating solitary water waves was carried out, comparing it with the KdV Equation two-soliton solution. Experiments were conducted in a wave channel of width 0.8m, with a 30m length available for the interactions, at a water depth of $h = 0.16\text{m}$. Solitary waves were generated using a piston wave maker. The higher wave height a_2 was fixed, with the parameter $\alpha_2 = a_2/h \approx 0.5$; several lower wave heights were used, with $\alpha_1 \in (0.1, 0.3)$. Surface displacements were measured in fixed locations by resistive probes. The interactions were found to be solitonic, which is predicted by KdV theory. Graphs of surface level vs. time were compared with the KdV two-soliton solutions fitted to the initial wave profiles. Experimental graphs generally differed with theoretical on phases. When heights a_1, a_2 were comparable, KdV theory acceptably described the qualitative behavior of the interaction. However, when a_1/a_2 was relatively low, the second half of the interaction was more complicated experimentally than theoretically.

¹Student

Jose Alberto Morales
FC-UNAM

Date submitted: 03 Aug 2008

Electronic form version 1.4