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An Experiment on Two-Dimensional Interaction of Solitary Waves in Shallow Water System HIDEKAZU TSUJI, KEI YUFU, KENJI MARUBAYASHI, Research Institute for Applied Mechanics, Kyushu University Japan — The dynamics of solitary waves in horizontally two-dimensional region is not yet well understood. Recently two-dimensional soliton interaction of Kadomtsev-Petviashvili (KP) equation which describes the weakly nonlinear long wave in shallow water system has been theoretically studied (e.g. Kodama (2010)). It is clarified that the “resonant” interaction which forms Y-shaped triad can be described by exact solution. Li et al. (2011) experimentally studied the reflection of solitary wave at the wall and verified the theory of KP equation. To investigate more general interaction process, an experiment in wave tank using two wave makers which are controlled independently is carried out. The wave tank is 4m in length and 3.6 m in width. The depth of the water is about 8cm. The wavemakers, which are piston-type and have board about 1.5m in length, can produce orderly solitary wave which amplitude is 1.0-3.5cm. We observe newly generated solitary wave due to interaction of original solitary waves which have different amplitude and/or propagation direction. The results are compared with the aforementioned theory of KP equation.

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