The generation of symmetric and asymmetric lump solitons by a bottom topography[1] ZHIMING LU, Shanghai University — A group of Lump solutions to the (2+1)-dimensional Kadomtsev-Petviashvili (KP) equation is obtained analytically by making use of Hirota bilinear transform method. Then the generation of symmetric and asymmetric lump solitons by an obliquely-placed three-dimensional bottom topography is numerically investigated using the forced Kadomtsev-Petviashvili-I (fKP-I) equation. The numerical method is based on the third order Runge-Kutta method and the Crank-Nicolson scheme. The main result is the asymmetric generation of asymmetric lump-type solitons downstream of the obstacle.The lump soliton with a smaller amplitude is generated with a longer period and moves in a larger angle with respect to the positive x-axis than the one with a larger amplitude. The amplitude of the lump solitons strongly depend on the volume of the obstacle rather than the shape. Finally the effects of the detuning parameter on the generation of lump solitons is also studied.

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