國立交通大學應用數學系
學術演講公告

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講　題：Critical free surface flow over topography

時　間：108 年 10 月 22 日(星期二) 下午 14:00 –15:00

地　點：(光復校區) 科學一館 223 室

茶　會：當天下午 1:30 (科學一館 205 室)

Abstract

Two-dimensional free-surface flow over a localised bottom topography is examined with an emphasis on calculating steady, forced solitary-wave solutions. In particular we focus on the case of a Gaussian dip topography. Most of the focus is on the weakly-nonlinear limit where a forced KdV equation is applicable, and the problem essentially boils down to solving a forced nonlinear ODE with a single parameter that quantifies the amplitude of the topography. This equation has a rich solution space with a large (probably infinite) number of solution branches. Asymptotic analysis for small topography amplitude reveal some interesting features, for example an internal boundary layer which mediates a change from exponential to algebraic decay of the free-surface in the far-field. Traditional boundary-layer theory fails beyond the first two solution branches, where the surface profiles feature multiple waves trapped over the topography. The stability of the steady solutions will also be briefly discussed.

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