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Travelling Long Waves in Water Channels of Variable Cross Section

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A rigorous travelling wave solution in water channels of rectangular cross section with variable depth and width is obtained in the framework of shallow water theory. The differential equation connecting depth and width of the channel for the case of non-reflecting wave propagation is derived. It is shown that the number of geometries and con¬figurations, which allow non-reflecting wave propagation, is unlimited. Thus, the effect of very long-distance wave propa¬gation is rather common and can play an important role in the interpretation of the observed extreme inundations caused by tsunami.