



Wave-current interaction, experiments with controlled uniform shear

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Vertically varying currents have a non negligible impact on the propagation of waves. Even though the analytical aspect of the interaction between wave and sheared current is being an active subject of research, experimental data remain rare. Here, the effects of a uniformly shear were investigated in the 10 m long by 0.3 m wide wave flume of the Université de Toulon, France. The main difficulty of the study was to produce several conditions of current with constant shear ($du/dz = cst$) that would persist along the channel. This was achieved by using curved wire screens upstream the channel (Dunn and Tavoularis, 2007). The geometry and properties of the screens were adjusted to deflect the streamline towards the channel bed or the free surface in order to change the velocity profile. The study focused on regular wave propagating against the current for several wave frequencies and amplitudes. Properties of the free surface and flow velocity are discussed for current with positive and negative shear in order to quantify the influence of the current on the waves.

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