

Abstract Submitted
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Experimental observation of trapped modes in a water wave channel PABLO COBELLI, Laboratoire de Physique et Mécanique des Milieux Hétérogènes - PMMH - ESPCI, VINCENT PAGNEUX, Laboratoire d'Acoustique - Université du Maine - LAUM, AGNÈS MAUREL, Laboratoire Ondes et Acoustique - LOA - ESPCI, PHILIPPE PETITJEANS, Laboratoire de Physique et Mécanique des Milieux Hétérogènes - PMMH - ESPCI — The fluid around a free surface piercing circular cylinder in a long narrow wave tank can exhibit a local oscillation that does not propagate down the channel but is confined to the vicinity of the cylinder. This is a manifestation of the so-called trapped modes, bound states occurring in a wide variety of situations in physics. In this study, we present the first whole-field time resolved measurements for the free surface deformation obtained by a Fourier transform profilometry technique. The scattering characteristics of the cylinder and consequently the behavior of the trapped mode frequency are determined. The experimental results show good agreement with the predictions arising from linear water-wave theory.

Pablo Cobelli
Laboratoire de Physique et Mécanique des
Milieux Hétérogènes - PMMH - ESPCI

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