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Vortex dynamics in a wave field GAELE PERRET, ADRIEN POUPARDIN, JEROME BROSSARD, LOMC - CNRS FRE3102, Universite du Havre — The interaction of waves and current with submerged structures in coastal zones generates some complex hydrodynamics features which may considerably impact the local environment. The geometrical singularities of the structures produce concentrated vortex filaments which may impact the sea bed and/or the free surface. The objective of the present study is to characterize the vortex dynamics generated by a horizontal plate considered as a vortex generator, in a regular wave field. Vortices are generated at the edges of the plate. They undergo three-dimensional instabilities leading to their destruction. Their dynamics is investigated thanks to laboratory experiments conducted in two different wave flumes to study the impact of the scale on the dynamics. The two-dimensional vortex dynamics is characterized using PIV measurements. Vortex intensity, trajectory and life time are determined. The three-dimensional dynamics is studied thanks to stereo photography. The vortices are visualised with hydrogen bubbles generated at the edges of the plate by electrolyse. The evolution of the vortices is visualized by two CCD cameras located in different planes. Two most unstable wavelengths are observed which do not seem to depend on the width of the wave flume.

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