

Abstract Submitted  
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**3D experimental investigation of vortex dipoles in shallow water** JULIE ALBAGNAC, Institut de Mecanique des Fluides de Toulouse, PIERRE BRANCHER, OLIVIER EIFF, LAURENT LACAZE, FREDERIC MOULIN, IMFT — Vortex dipoles are often associated to sediments transport. Shallow dipoles have often been expected to exhibit Quasi-2D dynamics. However, recent lab experiments have shown the existence of a horizontal spanwise vortex at the front of the dipole. It is of great importance to describe and quantify their dynamics. We investigate dipole evolution and spanwise vortex formation. Reproducible laminar dipoles are created with flap apparatus. For fixed flaps gap, shallowness of the dipole and dipole propagation velocity are the parameters controlling the flow. PIV measurements were performed in two horizontal planes and the vertical symmetry one for a wide range of control parameters. These measurements led us to define criteria on the spanwise vortex generation and dynamics. Complete 3D geometry and dynamics of the dipole are obtained using 3D-3C scanning PIV. Transition from a Q-2D dipole to a 3D dipole considering the spanwise vortex has been enhanced thanks to this powerful technique.

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