

Abstract Submitted  
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**Spreading of non-planar non-axisymmetric gravity and turbidity currents**<sup>1</sup> NADIM ZGHEIB, Univ of Florida - Gainesville, THOMAS BONOMETTI, Institut de Mécanique des Fluides de Toulouse, S. BALACHANDAR, Univ of Florida - Gainesville — The dynamics of non-axisymmetric turbidity currents is considered here. The study comprises a series of experiments for which a finite volume of particle-laden solution is released into fresh water. A mixture of water and polystyrene particles of diameter  $280 < D_p < 315\mu m$  and density  $\rho_c = 1007Kg/m^3$  is initially confined in a hollow cylinder at the center of a large tank filled with fresh water. Cylinders with four different cross-sections are examined: a circle, a plus-shape, a rectangle and a rounded rectangle in which the sharp corners are smoothed. The time evolution of the front is recorded as well the spatial distribution of the thickness of the final deposit via the use of a laser triangulation technique. The dynamics of the front and final deposit are significantly influenced by the initial geometry, displaying substantial azimuthal variation especially for the rectangular case where the current extends farther and deposits more particles along the initial minor axis of the rectangular cross section. Interestingly, this departure from axisymmetry cannot be predicted by current theoretical methods such as the Box Model. Several parameters are varied to assess the dependence on the settling velocity, initial height aspect ratio, local curvature and mixture density.

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