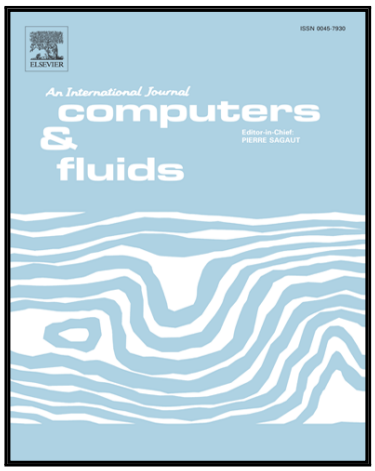

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SUSPENSION-DRIVEN GRAVITY SURGES ON HORIZONTAL SURFACES: EFFECT OF THE INITIAL SHAPE

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We present results from highly resolved direct numerical simulations of canonical (axisymmetric and planar) and non-canonical (rectangular) configurations of horizontal suspension-driven gravity surges. We show that the dynamics along the initial minor and major axis of a rectangular release are roughly similar to that of a planar and axisymmetric current, respectively. However, contrary to expectation, we observe under certain conditions the final extent of the deposit from finite releases to surpass that from an equivalent planar current. This is attributed to a converging flow of the particle-laden mixture towards the initial minor axis, a behaviour that was previously reported for scalar-driven currents on uniform slopes (Zgheib *et al.* 2016). This flow is observed to be correlated with the travelling of a perturbation wave generated at the extremity of the longest side that reaches the front of the shortest side in a finite time. A semi-empirical explicit expression (based on established relations for planar and axisymmetric currents) is proposed to predict the extent of the deposit in the entire x-y plane. Finally, we observe that for the same initial volume of a suspension-driven gravity surge, a release of larger

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