

Abstract Submitted
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Rosace patterns in drop impact GUILLAUME LAGUBEAU, LAUM, UMR CNRS 6613, Le Mans France, MARCO FONTELOS, Instituto de Ciencias Matematicas, Madrid, CHRISTOPHE JOSSERAND, Institut D'Alembert, UMR 6613, UPMC Paris, AGNÈS MAUREL, Institut Langevin, UMR 7587, ESPCI Paris, VINCENT PAGNEUX, LAUM, UMR 6613, Le Mans France, PHILIPPE PETIT-JEANS, PMMH, UMR 7636, ESPCI, France, ANR-08-BLAN-0108 TEAM, ANR-09-JCJC-0022 COLLABORATION, MTM2008-03255 COLLABORATION — We report an experimental study of the instability of the corolla for drop impacts on liquid surface for moderate Weber numbers (We) and millimetric liquid layers (of thickness h), where no splash is observed. Thanks to a Fourier Transform Profilometry technique (FTP), we exhibit and analyze for the first time the formation of a rosace-like pattern originated from an hydrodynamic instability. Using the shallow water approximation, we explain the main mechanisms leading to these patterns: it consists in the linear instability of the self-similar axisymmetric radial solution of the equations. We found that the number of folds scales like We/h at the power $2/7$ as observed in our experiments.

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