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Dynamics of drop impact on a rectangular slot HARIPRASAD JANAKIRAM SUBRAMANI¹, TALAL AL-HOUSSEINY, OSMAN BASARAN, School of Chemical Engineering, Purdue University, West Lafayette, IN 47907 — Drop impact on substrates is of scientific importance, and plays a central role in both micro- and large-scale applications, e.g. ink-jet printing and spray coating. For over 100 years, researchers have studied situations where drops impact planar substrates, a beautiful free surface flow resulting either in drop deposition or splashing. By contrast, drop impact on non-planar substrates, e.g. spheres, has become of interest only recently. Here, the impact of drops of several liquids with a slot of width comparable to the drop diameter that is dug into an otherwise planar substrate is studied experimentally as a function of impact velocity. Two different kinds of splashing arise in the new experiments: an internal splash similar to that observed on planar substrates and a new, external splash, where some of the drop liquid splashes out of the slot. Phase diagrams that delineate regimes of drop spreading and splashing are presented. Simple scaling arguments are also developed to rationalize the findings.

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