Abstract Submitted
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Solidification of a rivulet : Temperature fields[1] ANTOINE MONIER, Sorbonne Universit, CNRS, UMR 7190, Institut Jean Le Rond Alembert, F-75005 Paris,France, AXEL HUERRE, Laboratoire dHydrodynamique (LadHyX), UMR 7646 CNRS-Ecole Polytechnique, IP Paris,91128 Palaiseau CEDEX, France, THOMAS SON, Sorbonne Universit, CNRS, UMR 7190, Institut Jean Le Rond Alembert, F-75005 Paris,France, CHRISTOPHE JOSSERAND, Laboratoire dHydrodynamique (LadHyX), UMR 7646 CNRS-Ecole Polytechnique, IP Paris,91128 Palaiseau CEDEX, France, SORBONNE UNIVERSIT, CNRS, UMR 7190, INSTITUT JEAN LE ROND ALEMBERT, F-75005 PARIS,FRANCE TEAM, LABORATOIRE DHYDRODYNAMIQUE (LADHYX), UMR 7646 CNRS-ECOLE POLYTECHNIQUE, IP PARIS,91128 PALAISEAU C TEAM — We study experimentally the solidification of a water rivulet flowing down an inclined plane cooled to subzero temperatures. The system reaches ultimately a stationary state where the water continues to flows on top of the solidified structure. The ice exhibits a surprising linear geometry, with distance from the injection point. Thermal convection from the constant water supply plays a role in the establishment of the static ice shape. The resolution of the thermal problem enables to recover the geometry of the ice structure. The comparison between theoretical resolution of the thermal problem and the measurements taken from an infrared camera, shows very good agreements, validating the thermal boundary layer model.

[1]Direction General de l'Armement

Antoine Monier
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