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Flow visualization of the water impact problem HANS MAYER, ROUSLAN KRECHETNIKOV, University of California at Santa Barbara — When a flat plate impacts the surface of an incompressible viscous liquid, the liquid directly beneath the plate is set into motion and an ejecta – a high speed jet – forms at the plate edge giving rise to the familiar "splashing" behavior. We present the results of our experimental investigation of the water impact problem using a particle image velocimetry (PIV) system to quantify the flow field beneath the plate immediately after impact with the speeds of the order of $1\,\mathrm{m/s}$. The early-time formation of the ejecta for this flat plate geometry, including the influences of liquid viscosity ($1 < \mu < 10\,\mathrm{mPa \cdot s}$) and surface tension ($20 < \sigma < 70\,\mathrm{mN/m}$), are also studied with the PIV and high speed photography. Quantitative results for the flow field in the region beneath the plate and the growth of the ejecta are compared to existing and newly-developed theories.

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