Abstract Submitted
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Numerical simulation of drop impact on a controlled falling liquid film[1] ZHIZHAO CHE, Tianjin University, China, IDRIS ADEBAYO, ZHIHUA XIE, DIMITRIOS PAVLIDIS, PABLO SALINAS, OMAR MATAR, Imperial College London — We study the impact process of droplets falling obliquely on controlled films using a numerical simulation approach. This approach is based on a finite element discretisation of the Navier Stokes equations on fully unstructured anisotropic and adaptive meshes, which are capable of representing the underlying physics of multiphase problems accurately while also reducing computational effort. Liquid film control here is applied to ensure that droplet impact occurs on different, targeted regions of a controlled film surface viz. capillary waves preceding a large-amplitude wave, flat film regions, and wave humps. The outcomes of droplet impact on these different regions are then compared and the differences discussed. The effect of varying the film flow rate, droplet speed, and droplet size on a number of droplet impact outcomes is also studied and the results further compared with those from uncontrolled as well as quiescent liquid films.

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