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3D simulation of liquid-gas flows with contact lines and applications to drop impact on a fiber SHENG WANG, OLIVIER DESJARDINS, Cornell University — In this talk, we propose a numerical approach to simulate liquid-gas flows with contact lines, then, apply it to investigate drop impact on a horizontal fiber. This approach combines a conservative level set method to capture the interface, an immersed boundary method to represent the curved boundary, and a curvature boundary method to treat the contact lines.The simulation results are compared with experimental results. Two key aspects are investigated: the critical velocity for a drop to be captured by a fiber, and the topology of the impacting drop. Numerical results show good qualitative agreement with experiments in predicting the critical velocity. A regime map of drop topology based on the Weber number and drop-to-fiber diameter ratio is compared to the experimental results.

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