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Investigation of the flow characteristics of a falling film along an inclined surface with planar laser-induced fluorescence method

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ABSTRACT

Planar laser-induced fluorescence technology was used to investigate the three-dimensional film thickness distribution of falling film on an inclined surface. The film thickness distributions in both the streamwise and the spanwise direction were presented for various inclination angles, the surface tensions and the flow rates. The results show that the spanwise liquid film distribution has a "bow" shape, the film thickness and film width increase with increasing flow rate. The film width decreases with increasing liquid surface tension, but the film thickness of the ripples increases.

Keywords: Falling film; Film thickness; Flow state; Planar laser-induced fluorescence

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