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**Retention of infused liquid for sustenance of drag reduction of turbulent flow over liquid infused surface** MARTAND MAYUKH GARIMELLA, EDGARDO JAVIER GARCIA CARTAGENA, STEFANO LEONARDI, The University of Texas at Dallas — Liquid infused surfaces (LIS) are composed of functionalized surface textures wetted with an immiscible, chemically-matched liquid lubricant. It has been experimentally demonstrated that grooved LIS configurations can reduce turbulent drag up to 35%. However, in practical configurations, due to high shear exerted by the flow, the infused liquid may get washed away. Previous studies have considered longitudinal bars. However, this texture cannot hold the lubricant-gas in the cavities. An alternative would be to place transversal bars to retain this lubricant. Direct numerical simulations of the flow in a channel with a rectangular mesh on the lower wall have been carried out. The aspect ratios of the cavities, the Reynolds and Weber numbers were varied. Also, two viscosity ratios between the two fluids,  $N=0.02$  and  $N=0.4$  were used to mimic idealized superhydrophobic and liquidinfused surfaces. In comparison to the flow over longitudinal bars, the addition of transverse bars reduces drag reduction. However, it was observed that the flow recirculates within the cavities with an expected reduction in drainage. In addition, at a higher Weber number, the interface above the mesh texture is more stable than that over longitudinal bars.

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