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3-D CFD Simulations of Liquid Laminar Flow over Superhydrophobic Surfaces for two scenarios: (1) Shear-driven Flow with Square Post Geometries, (2) Pressure-driven Flow with Rectangular Post Geometries ABOLFAZL AMIN, DAN MAYNES, BRENT WEBB, Brigham Young University — We numerically investigate the influence of post patterned superhydrophobic surfaces on the drag reduction for liquid flow through microchannels. Hydrophobically coated surfaces exhibiting microscale structures such as ribs/cavities and posts/cavities can significantly reduce the liquid-solid contact. Preventing liquid from entering the cavities increases the fraction of liquid-gas interface, which results in reduced surface friction. Fully developed steady state laminar flow for two scenarios is considered here. The effects of aspect ratio, cavity fraction, and relative module width on the slip length and on the Darcy friction factor-Reynolds number product, *fRe*, were explored numerically. Various aspect ratios, cavity fractions, and relative module widths were explored. The present results are compared with those for surfaces exhibiting square posts in pressure-driven liquid laminar flow. As the aspect ratio of the posts increased or decreased, the *fRe* values asymptotically approached those of surfaces exhibiting longitudinal and transverse ribs, respectively.

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