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Fluids Moving Past Smooth Hydrophilic Surfaces – Slip? JANET WONG, SUNG-CHUL BAE, LIANG HONG, STEVE GRANICK, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign — Recent experiments challenge the traditional view that fluids satisfy the "no-slip" boundary condition. While the amount of slip observed differs between research groups, it is now generally accepted that the no-slip boundary condition need not hold strictly – if the surface is smooth and hydropobic. What happens if the surface is wetted by the moving fluid? This work describes hydrodynamic studies of fluid between two crossed cylinders in a surface forces apparatus, using a new method of mica cleaving that appears to produce different findings from those obtained from classical methods. Aqueous salt solutions with various ion concentrations were used with mica as the confining surface. The role of salt concentration was explored. Independently, the fluorescence lifetime of fluorescent dyes was used to measure the near-surface ionic conditions independent of a force measurement.

Janet Wong
Department of Materials Science and Engineering
University of Illinois at Urbana-Champaign

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