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**Induced charge electroosmosis in microfluidic devices** YUXING BEN, Applied Math & Institute of Soldier Nanotechnology, Massachusetts Institute of Technology, JEREMY LEVITAN, Mechanical Engineering & Institute of Soldier Nanotechnology, Massachusetts Institute of Technology, HOWARD STONE, Division of Engineering and Applied Science, Harvard University, TODD THORSEN, Mechanical Engineering, Massachusetts Institute of Technology, MARTIN BAZANT, Applied Math & Institute of Soldier Nanotechnology, Massachusetts Institute of Technology — Induced charge electroomosis (ICEO) is an attractive way to pump and mix fluid in microfluidic devices. Such devices have the advantages of low voltages and low power consumptions. It is easy to control and manipulate fluid with an AC electric field. In this paper, we study ICEO around a cylinder between flat plates. An analytic solution for this geometry is obtained. More complicated geometries are exploited by finite element simulations for optimal pumping down a channel. In all cases, we compare with experiments where devices are fabricated by electroplating gold on glass in polymer micrchannels, and flow is visualized by microPIV, with reasonable agreement.

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