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Electroosmotic flow in rectangular microchannels: numerical simulation and asymptotic theory[1] SUBHRA DATTA, SANDIP GHOSAL, NEELESH PATANKAR, Northwestern University — The problem of fluid flow in a microfluidic channel of rectangular cross- section is solved numerically when the zeta potential is not uniform. Variations in the axial direction as well as along the perimeter of the channel cross-section is considered. Excellent agreement is found with a previously published (Ghosal, 2002 JFM vol.459 pg. 103) asymptotic theory based on the lubrication approximation, even when the length scale of axial variations is of the same order as the characteristic channel width.

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Sandip Ghosal
Northwestern University

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