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Boundary conditions on a hydrogel-fluid interface[1] JIMMY FENG, University of British Columbia, YUAN-NAN YOUNG, New Jersey Institute of Technology — Hydrogels are an important class of soft material for biological, biomedical and Micro-Electro-Mechanical Systems (MEMS) applications. Hydrogels are often deployed alongside fluids, thus the interfacial dynamics of a gel-fluid system becomes an interesting question. Given the wide range in length scales, from the nanometer pore size in the gel to the dimension of a MEMS device (millimeters or more), it seems appropriate to model the hydrogel as a two-phase mixture of a (deformable) skeleton and a liquid that permeates the gel. In such a poroelastic framework, the boundary conditions on the gel-fluid interface are extremely tedious to derive from first principles of coarse-graining, and must be postulated. In this talk, we describe an energy dissipation formalism that suggests two sets of boundary conditions. We will compare the flow profiles predicted by these conditions with those of published models.

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