Abstract Submitted
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A liquid bridge connecting moving porous surfaces[1] MORTEZA GHARIB, AMIR GAT, Caltech, HOMAYUN NAVAZ, Kettering University — We study the coupled problem of a liquid bridge connecting two porous surfaces where the gap between the surfaces is an externally controlled function of time. The relative motion between the surfaces affects the geometry and the pressure distribution of the liquid bridge, thus influencing the diffusion speed and penetration topology within the porous material. Utilizing the lubrication approximation and Darcy's phenomenological law we obtain a relation between the diffusion into the porous surface and the relative motion between the surfaces. A scheme to control the diffusion topology is presented and illustrated for the case of conical penetration topology with an arbitrary cone opening angle. Analytic expressions describing the penetration topology for the case of constant speed of the surfaces and the relative motion between the surfaces required to create a conical penetration topology are obtained and compared to experimental and numerical data.

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Amir Gat
Caltech

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