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Stability of a stationary moving droplet in porous medium<sup>1</sup> DMITRIY LYUBIMOV, SERGEY SHKLYAEV, Perm State University, Russia, TATYANA LYUBIMOVA, Institute of Continuous Media Mechanics UB RAS, Perm, Russia, OLEG ZIKANOV, University of Michigan-Dearborn, MI, USA — We consider sedimentation of a drop in a porous medium saturated by another fluid. Brinkman model is applied, whereas the interface of drop is assumed sharp and the capillary forces are neglected. The velocity of stationary sedimentation for the spherical drop is obtained. The resulting expression matches both the Hadamard-Rybczynski formula and the result for the conventional Darcy model in corresponding asymptotic limits. Stability of the stationary motion is studied. It is shown, that the drop is always unstable to perturbations that lead to formation of a cusp in the vicinity of the rear stagnation point. This behavior is similar to that for a drop in the absence of the porous matrix. Thus, the Brinkman model eliminates the unphysical features inherent to the Darcy model.

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