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Superhydrophobic frictions TIMOTHEE MOUTERDE, PASCAL RAUX, CHRISTOPHE CLANET, DAVID QUERE, (PMMH, ESPCI / LadHyX, Ecole Polytechnique) — We discuss the nature of the friction opposing the motion of drops running on superhydrophobic materials. Despite the high mobility of the drops (which are typically 100 times faster than on usual solids), friction is always found to have a viscous origin. For highly viscous liquids, we recover a Mahadevan-Pomeau regime for which the drop speed is inversely proportional to the viscosity. In the opposite limit (e.g. water), friction depends on the material texture and it is interpreted as resulting either from the development of a viscous boundary layer at the solid/liquid interface, or from the shear inside the subjacent air cushion. In the latter case, air is not only responsible for the existence of superhydrophobic states, but also for the resistance limiting speed of water in these states.

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