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**Friction boosted by spontaneous epitaxial rotations**[1] DAVIDE MANDELLI, SISSA, ANDREA VANOSSI, CNR-IOM Democritos and SISSA, NICOLA MANINI, Universitá degli studi di Milano, SISSA and CNR-IOM Democritos, ERIO TOSATTI, ICTP, SISSA and CNR-IOM Democritos — It is well known in surface science that incommensurate adsorbed monolayers undergo a spontaneous, energy-lowering epitaxial rotation from aligned to misaligned relative to a periodic substrate. We show first of all that a model 2D colloidal monolayer in an optical lattice, of recent importance as a frictional model, also develops in full equilibrium a small rotation angle, easy to detect in the Moiré pattern. The colloidal monolayer misalignment is then shown by extensive sliding simulations to increase the dynamic friction by a considerable factor over the aligned case. More generally, this example suggests that spontaneous rotations are rather ubiquitous and should not be ignored in all tribological phenomena between mismatched lattices.

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