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The domino shuffling algorithm and anisotropic KPZ stochastic growth

The domino-shuffling algorithm can be seen as a stochastic process describing the irreversible growth of a (2+1)-dimensional discrete interface. Its stationary speed of growth $v(\rho)$ depends on the average interface slope ρ, as well as on the edge weights w, that are assumed to be periodic in space. We show that this growth model belongs to the Anisotropic KPZ class: one has $\det[D^2 v(\rho)]<0$ and the height fluctuations grow at most logarithmically in time. Moreover, we prove that $Dv(\rho)$ is discontinuous at each of the (finitely many) smooth (or “gaseous”) slopes ρ; at these slopes, fluctuations do not diverge as time grows. The proof avoids the explicit computation of $v(\rho)$, very hard to achieve for general weights, and goes instead through a relation between the speed of growth and the limit shape of domino tilings of the Aztec diamond. Joint work with Sunil Chhita (Durham).