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No sliding in time KIRILL SHTENGEL, UC Riverside, CHETAN NAYAK, Microsoft, WAHEB BISHARA, Caltech, CLAUDIO CHAMON, Boston University — We analyse the following apparent paradox: As has been recently proved by Hastings, under a general set of conditions, if a *local* Hamiltonian has a spectral gap above its (unique) ground state, all connected equal-time correlation functions of local operators decay exponentially with distance. On the other hand, statistical mechanics provides us with examples of 3D models displaying so-called sliding phases which are characterised by the algebraic decay of correlations within 2D layers and exponential decay in the third direction. Interpreting this third direction as time would imply a gap in the corresponding (2+1)D quantum Hamiltonian which would seemingly contradict Hastings' theorem. The resolution of this paradox lies in the non-locality of such a quantum Hamiltonian.

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