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Statistics of fingering convection in 2D and 3D

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The fingering instability is a flavour of doubly-diffusive instability that, close to marginality, leads to the formation of tall and thin columns of convecting fluid. This phenomenon is particularly interesting in oceanography, because in vast areas of the subtropical termocline temperature and salinity are stratified in a finger-favourable way. While the linear instability is rather well understood, the nonlinear dynamics far from marginality is not. In the fully nonlinear regime the dominant patterns change from tall fingerlike structures to buoyant and sinking blobs. In the literature this regime has been explored mostly by means of two-dimensional numerical simulations, while three-dimensional studies have been less frequent because of their high computational cost. We present a comparison of the statistics of fully nonlinear fingering convection in 2D and 3D simulations, for Rayleigh numbers up to 10^{11}.