

## Geometry and dynamics of improvements to Dirichlet's Theorem in Diophantine approximation

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The set  $\hat{D}^{m,n}$  of  $m \times n$  matrices (systems of  $m$  linear forms in  $n$  variables) for which Dirichlet's theorem admits an improvement was originally studied by Davenport and Schmidt. They showed that the Lebesgue measure of  $\hat{D}^{m,n}$  is zero, and that it contains the set of badly approximable matrices, hence has full Hausdorff dimension. A geometric approach to the notion of Dirichlet improvement identifies  $\hat{D}^{m,n}$  with the set of lattices whose orbits stay away from the critical locus for the supremum norm. Based on that, I will present a generalized version of the Dirichlet improvement property and of theorems of Davenport and Schmidt. Joint work with Anurag Rao, and with Jinpeng An and Lifan Guan.