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A variant of Kaufman's measures in two dimensions.

An old result of Kaufman showed that the set Bad of badly approximable
numbers supports a family of probability measures with polynomial decay rate on their Fourier transform.
We show that the same phenomenon can be observed in a two-dimensional setup: we consider the set
$B=\{(\alpha,\gamma)\in[0,1]^2 : \inf\|q\alpha-\gamma\|>0\}$ and we prove that it supports certain probability measures with Frostman dimension arbitrarily close to 2 and Fourier transform with polynomial decay rate. (Joint work with S. Chow and E. Zorin).