

Dirichlet uniformly well-approximated numbers

Dong Han Kim, Dongguk University

Fix an irrational α . For a positive real number τ , consider the numbers y satisfying that for all large number Q , there exists a positive integer n bounded by Q , such that the distance of $n\alpha - y$ to its nearest integer is smaller than $1/Q^\tau$. These numbers are called Dirichlet uniformly well-approximated numbers. For any positive τ , the Hausdorff dimension of the set of these numbers is obtained and is shown to depend on the irrationality exponent of α . It is also proved that with respect to τ , the only possible discontinuous point of the Hausdorff dimension is where τ equals to.

This is joint work with Lingmin Liao.