

Hausdorff measure of sets of Dirichlet non-improvable numbers

Mumtaz HUSSAIN
La Trobe University

Let $\psi : \mathbb{R}_+ \rightarrow \mathbb{R}_+$ be a non-increasing function. A real number x is said to be ψ -Dirichlet improvable if it admits an improvement to Dirichlet's theorem in the following sense: the system

$$|qx - p| < \psi(t) \quad \text{and} \quad |q| < t$$

has a non-trivial integer solution for all large enough t . In this talk, I will briefly explain that the Hausdorff measure of the set of ψ -Dirichlet non-improvable numbers obeys a zero-infinity law for a large class of dimension functions.

Together with the Lebesgue measure-theoretic results established by Kleinbock & Wadleigh (2016) [KW], our results contribute to building a complete metric theory for the set of Dirichlet non-improvable numbers. (This is a joint work with D. Kleinbock, N. Wadleigh and B-W. Wang)

[KW] D. Kleinbock and N. Wadleigh, *A zero-one law for improvements to Dirichlet's theorem*, Pre-print: arXiv:1609.06780, Proc. Amer. Math. Soc., to appear.