

A mass transference principle for systems of linear forms with applications to Diophantine approximation

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In Diophantine approximation we are often interested in the Lebesgue and Hausdorff measures of certain limsup sets. In 2006, Beresnevich and Velani proved a remarkable result — the Mass Transference Principle — which allows for the transference of Lebesgue measure theoretic statements for limsup sets arising from a sequence of balls in \mathbb{R}^k to Hausdorff measure theoretic statements. Subsequently, they extended this Mass Transference Principle to the more general situation in which the limsup sets arise from a sequence of neighbourhoods of “approximating” planes. In this talk I will discuss a recent strengthening (joint with V. Beresnevich) of this latter result in which some potentially restrictive conditions have been removed from the original statement. This improvement gives rise to some very general statements which allow for the immediate transference of Lebesgue measure Khintchine–Groshev type statements to their Hausdorff measure analogues and, consequently, has some interesting applications in Diophantine approximation.