
ISABELLA LABA, UBC

Buffon's needle estimates and vanishing sums of roots of unity

Buffon's needle problem concerns estimates on the average (with respect to angle) length of 1-dimensional projections of finite iterations of planar Cantor sets. The purpose of the talk will be to present recent work with Matthew Bond and Alexander Volberg on estimates of this type for rational product Cantor sets. We will emphasize the number-theoretic aspects of the problem, including a surprising connection to the classic results of Redei, de Bruijn, Schoenberg, Mann, and others on the classification of vanishing sums of roots of unity.