

Optimal Bounds for Discrepancies of Irrational translations on the torus

Hao Wu

Abstract

The orbit of irrational rotations is equidistributed over the circle. A closer look at the discrepancy functions leads to studies on limit laws where the rotation is randomized and almost sure bounds where the rotation is generic but fixed. We present several results in the direction of almost sure bounds. Specifically, we obtain almost optimal upper bounds for maximal discrepancies in the case of toral translations relative to polygons, as well as the case of linear forms relative to intervals on the circle. These results extend Beck's work on maximal discrepancies of toral translations for straight boxes to more general settings.