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Irrational rotations, random affine transformations and the central limit theorem

Abstract:

It is a well-known result from Hermann Weyl that if alpha is an irrational number in \([0,1)\) then the number of visits of successive multiples of alpha modulo one in an interval contained in \([0,1)\) is proportional to the size of the interval. In this talk we will revisit this problem, now looking at finer joint asymptotics of visits to several intervals with rational end points. We observe that the visit distribution can be modelled using random affine transformations; in the case when the irrational is quadratic we obtain a central limit theorem as well. Not much background in probability will be assumed. This is in joint work with Jon Aaronson and Michael Bromberg.