

RECENT PROGRESSS IN HYPERBOLIC LATTICE POINT PROBLEMS

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ABSTRACT: In the euclidean space, lattice point problems –such as the classical Gauss circle problem– have been extensively studied. In particular, there are statistical results about points in annuli and even on individual circles. In the hyperbolic plane, very recently Chatzakos, Kurlberg, Lester and Wigman found a way to approach the study of lattice points on individual circles and proved that their angles become equidistributed, as the radius grows. We show that a similar result holds if the circles are shifted so to have as their centre a Heegner point. Such a shift leads to study algebraic integers in imaginary quadratic fields, with given norm and satisfying a congruence condition. As a by-product of our work, we can write the classical hyperbolic circle problem as an explicit shifted convolution sum for the representations-by-a-norm-form function in imaginary quadratic fields. This is joint work with A. Fazzari.

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