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The Random Wave Conjecture for Eisenstein Series

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Abstract. A very interesting and deep conjecture in arithmetic quantum chaos is the random wave conjecture of Berry from 1977 and Hejhal and Rackner from 1992. For the full modular group, the conjecture says that in some sense, the Hecke Maass automorphic forms should behave like random waves, in the limit of large Laplacian eigenvalue. This can be formulated more precisely by proposing that on fixed compact regular sets, the moments of Hecke Maass forms of large eigenvalue, suitably normalized, should asymptotically equal the moments of a standard normal random variable.

We will describe a new asymptotic formula for the regularized fourth moment of the Eisenstein series for the full modular group, which is in agreement with the Random Wave Conjecture. This is based on a joint work with Rizwanur Khan, University of Mississippi, USA.

Keywords: Random Wave Conjecture; Arithmetic Quantum Chaos; L-functions.

References

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