ARITHMETIC STATISTICS OF MODULAR SYMBOLS

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Abstract: Mazur, Rubin, and Stein have recently formulated a series of conjectures about statistical properties of modular symbols in order to understand central values of twists of elliptic curve L-functions. Two of these conjectures relate to the asymptotic growth of the first and second moments of the modular symbols. In joint work with Morten S. Risager we prove these on average using analytic properties of Eisenstein series twisted with modular symbols. We also prove another conjecture predicting the Gaussian distribution of normalized modular symbols ordered according to the size of the denominator of the cusps.