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Moments of the error term in the Sato-Tate conjecture for elliptic curves

The Sato-Tate conjecture for elliptic curves was proved by L. Clozel, M. Harris, N. Shepherd-Barron and R. Taylor in a series of papers from 2008-2010. The Sato-Tate law is an asymptotic statement, one is naturally interested in studying the nature of the error terms. In this talk, I shall describe some results relating to moments of the error term when we consider averages over certain families of elliptic curves. This is joint work with Stephan Baier.