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Mean values of real Dirichlet characters and double Dirichlet series

We will study the double sum of Jacobi symbols

$$\sum_{n \leq X} \sum_{m \leq Y} \left(\frac{m}{n} \right).$$

An asymptotic formula valid for all values of X, Y was found by Conrey, Farmer and Soundararajan by using Poisson summation and then estimating the sums of Gauss sums that arise in the computation. We will study the sum using Mellin inversion twice and investigating the analytic properties of a double Dirichlet series. This leads to the same asymptotic with an improved error term.