

Explicit bounds for the number of sign changes of Hecke eigenvalues

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Let $\lambda_f(n)$ be the n -th normalized Fourier coefficient in the Fourier series associated with a holomorphic cusp form

$$f(z) = \sum_{n=1}^{+\infty} \lambda_f(n) n^{\frac{k-1}{2}} \exp(2in\pi z)$$

for the full modular group $SL_2(\mathbb{Z})$ of an even weight $k \geq 2$. In this paper, we will produce explicit constants for the proportion of sign changes of $\lambda_f(n)$ and thus we will improve the result of Matomäki and Radziwiłł concerning the order of magnitude of the number of sign changes on the subsequence of Hecke eigenvalues. Strikingly, our proof establishes a lower bound for the proportion of the sign change on the relative set of non-zero coefficients $\lambda_f(n)$ which asymptotically is independent of the form f .