MEAN VALUES AND VALUE DISTRIBUTION OF $\frac{L'}{L}(1+IT,\pi)$

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ABSTRACT: For π, a cuspidal automorphic representation of $GL_m(\mathbb{A}_\mathbb{Q})$, there is an associated L-function, $L(s,\pi)$. We study value distribution of its logarithmic derivative on 1-line, $\frac{L'}{L}(1+it,\pi)$. We are able to prove that for $t \in [T, 2T]$, in some sense, $\frac{L'}{L}(1+it,\pi)$ has "almost" normal distribution with mean 0 and variance $\sqrt{\frac{\log(y(T))}{y(T)}}$. An essential ingredient of the proof is the fact that our function of interest can be approximated by Dirichlet polynomial with coefficients supported on prime powers.

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