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Selberg's Central Limit Theorem for Quadratic Dirichlet L-functions over Function Fields

In this talk, we will discuss the logarithm of the central value $L\left(\frac{1}{2}, \chi_D\right)$ in the symplectic family of Dirichlet L-functions associated with the hyperelliptic curve of genus δ over a fixed finite field $\mathbb{F}_q$ in the limit as $\delta \to \infty$. Unconditionally, we show that the distribution of $\log \left| L\left(\frac{1}{2}, \chi_D\right) \right|$ is asymptotically bounded above by the Gaussian distribution of mean $\frac{1}{2} \log \deg(D)$ and variance $\log \deg(D)$. Assuming a mild condition on the distribution of the low-lying zeros in this family, we obtain the full Gaussian distribution.