Meeting: 1007, Santa Barbara, California, SS 13A, Special Session on Arithmetic Geometry

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Symmetric Powers of families of L-functions.

With $\lambda \in \overline{\mathbb{F}}_p \setminus \{0, 1, \infty\}$, it is well-known that the zeta function of the elliptic curve $E_\lambda : y^2 = x(x-1)(x-\lambda)$ has two reciprocal roots, say $\pi_1(\lambda)$ and $\pi_2(\lambda)$. Consider the infinite product

$$\prod_{\lambda} \prod_{i=0}^{k} (1 - \pi_1(\lambda)^i \pi_2(\lambda)^{k-i} T^{deg \lambda})^{-1/deg \lambda}$$

where λ runs over the complement of the zeros of the Hasse invariant (supersingular moduli) union $\{0, 1, \infty\}$. Products such as this arise naturally when one considers families of L-functions.

In this talk, we will briefly discuss some history behind products of this type and how Dwork viewed these products. In particular, we will see how one may view these as the symmetric powers of families of L-functions and how a study of their associated p-adic "Picard-Fuchs" equation helps determine many of their properties. (Received November 25, 2004)