1176-11-340   **Chantal David*** (chantal.david@concordia.ca), **Antoine Comeau-Lapointe**, **Matilde Lalin** and **Wanlin Li**. *On the vanishing of twisted L-functions of elliptic curves over function fields.*

Let E be an elliptic curve over Q, and χ be a Dirichlet character of order ℓ. Heuristics based on the distribution of modular symbols and random matrix theory have led to strong (and somewhat surprising) conjectures on the vanishing of the twisted L-functions $L(E, \chi, s)$ at $s = 1$ (David-Fearnley-Kisilevsky and Mazur-Rubin). In particular, it is conjectured that there are only finitely many characters of order $\ell > 5$ such that $L(E, \chi, 1) = 0$. We investigate in this talk the case of elliptic curves over function fields. For Dirichlet L-functions over function fields, Li and Donepudi-Li have shown how to produce infinitely many characters of order ℓ such that $L(\chi, 1/2) = 0$. We show that their work can be generalized to isotrivial curves $E/F_q(t)$, and we show that if there is one Dirichlet character χ of order ℓ such that $L(E, \chi, 1) = 0$, then there are infinitely many, leading to some specific examples contradicting (the function field analogue of) the number field conjectures. Such a dichotomy does not seem to exists for general (non-isotrivial) curves over $F_q(t)$, and we produce empirical evidence which suggests that the conjectures over number fields also hold over function fields for non-isotrivial $E/F_q(t)$. (Received January 25, 2022)

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