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Steven J Miller* (Steven.J.Miller@williams.edu), Department of Mathematics and Statistics, Williams College, Bronfman Science Center, Williamstown, MA 01267. *Finite conductor models for zeros near the central point of elliptic curve L-functions.*

Random Matrix Theory has successfully modeled the behavior of zeros of elliptic curve L-functions in the limit of large conductors. In this talk we explore the behavior of zeros near the central point for one-parameter families of elliptic curves with rank over $\mathbb{Q}(T)$ and small conductors. Zeros of L-functions are conjectured to be simple except possibly at the central point for deep arithmetic reasons; these families provide a fascinating laboratory to explore the effect of multiple zeros on nearby zeros. Though theory suggests the family zeros (those we believe exist due to the Birch and Swinnerton-Dyer Conjecture) should not interact with the remaining zeros, numerical calculations show this is not the case; however, the discrepancy is likely due to small conductors, and unlike excess rank is observed to noticeably decrease as we increase the conductors. We shall mix theory and experiment and see some surprisingly results, which lead us to conjecture that a new random matrix ensemble correctly models the small conductor behavior. (Received July 31, 2008)