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Zev Klagsbrun* (klagsbru@math.wisc.edu), Dept. of Mathematics, 480 Lincoln Dr., 313 Van Vleck Hall, Madison, WI 53703. *The Distribution of 2-Selmer Ranks of Quadratic Twists of Elliptic Curves.*

Given an elliptic curve E defined over a number field K , we can ask what proportion of quadratic twists of E have 2-Selmer rank r for any non-negative integer r . The Delaunay heuristics combined with work of Dokchitser and Dokchitser suggested a conjecture for this distribution that was verified by work of Heath-Brown, Swinnerton-Dyer, and Kane for elliptic curves over \mathbb{Q} with $E(\mathbb{Q})[2] \simeq \mathbb{Z}/2\mathbb{Z} \times \mathbb{Z}/2\mathbb{Z}$. We present new results for elliptic curves with $E(K)[2] = 0$ and with $E(K)[2] \simeq \mathbb{Z}/2\mathbb{Z}$. I will present joint work of Mazur, Rubin, and myself supporting the conjecture for curves with $E(K)[2] = 0$. Additionally, I will present some new results of my own for curves with $E(K)[2] \simeq \mathbb{Z}/2\mathbb{Z}$, including some surprising results that conflict with the conjecture. (Received September 18, 2011)