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Daniel Keliher* (daniel.keliher@tufts.edu). *Rank Growth of Elliptic Curves in S_4 Quartic Extensions.*

We investigate the rank growth of elliptic curves from \mathbb{Q} to S_4 quartic extensions K/\mathbb{Q} . In particular, we are interested in the quantity $\text{rk}(E/K) - \text{rk}(E/\mathbb{Q})$ for fixed E and varying K . When $\text{rk}(E/\mathbb{Q}) \leq 1$, with E subject to some other conditions, we prove there are infinitely many S_4 quartic extensions K/\mathbb{Q} over which E does not gain rank, i.e. such that $\text{rk}(E/K) - \text{rk}(E/\mathbb{Q}) = 0$. To do so, we show how to control the 2-Selmer rank of E in certain quadratic extensions, which in turn contributes to controlling the rank in families of S_4 quartic extensions of \mathbb{Q} . (Received January 21, 2022)