1125-05-1113   **Katherine Perry*** (`kep0024@auburn.edu`), 221 Parker Hall, Auburn, AL 36849, and **Chris Rodger**, **Hung-Lin Fu** and **Yuan-Hsun Lo**. *Rainbow Spanning Trees in Edge-Colored Complete Graphs.*

A spanning tree of a properly edge-colored complete graph, K_n, is rainbow provided that each of its edges receives a distinct color. In 1996, Brualdi and Hollingsworth conjectured that if K_{2m} is properly $(2m-1)$-edge-colored, then the edges of K_{2m} can be partitioned into m rainbow spanning trees except when $m = 2$. The existence of $\lfloor m/(500 \log(2m)) \rfloor$ mutually edge-disjoint rainbow spanning trees in the case where $m \geq 500,000$ was recently proved using probabilistic techniques. By means of an explicit, constructive approach, we construct $\lfloor \sqrt{6m+9}/3 \rfloor$ mutually edge-disjoint rainbow spanning trees for any positive value of m. Not only are the rainbow trees produced, but also some structure of each rainbow spanning tree is determined in the process. This improves upon best constructive result to date in the literature which produces exactly three rainbow trees. It also improves upon the probabilistic result for all m, at most 5.7×10^7.

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