

Spanning trees with few branch vertices

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A branch vertex in a tree is a vertex of degree at least three. We prove that, for all $k \geq 1$, every connected graph on n vertices with minimum degree at least $(\frac{1}{k+3} + o(1))n$ contains a spanning tree having at most k branch vertices. Asymptotically, this is best possible and solves a problem of Flandrin, Kaiser, Kužel, Li and Ryjáček, which was originally motivated by an optimization problem in the design of optical networks. The proof uses the regularity and absorbing methods; however, a novel aspect of the proof is the use of a more complex version of the reduced graph which we call the fractional random reduced graph.