Spanning trees of smallest maximum degree in subdivisions of graphs

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Given a positive integer k and a connected graph G, a k*-tree* of G is a spanning tree of G with maximum degree at most k. It is well-known that, for $k \geq 2$, the problem of deciding whether a graph has a k-tree is $\mathcal{NP}$-complete. Consequently, for a graph G, it is hard to determine the smallest integer k, denoted by $f(G)$, such that G contains a k-tree. However, it is proved here that an $f(G^*)$-tree of G^* can be found in polynomial time, where G^* is obtained from G by subdividing each edge of G exactly once. We consider classes Γ of graphs embeddable into fixed closed surfaces and present results on $\max\{f(G^*) \mid G \in \Gamma\}$ if it exists.

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