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T-shape Trees are Determined by their Signless Laplacian Spectrum

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A graph is said to be determined by spectrum of an associated matrix M if there is no other nonisomorphic graph with the same spectrum of M. A tree is called *starlike* if it has exactly one vertex of degree greater than two. The starlike with maximum degree 3 is called T-*shape*. We will denote by $T(l_1, l_2, l_3)$ the unique T-shape tree such that $T(l_1, l_2, l_3) - v = P_{l_1} \cup P_{l_2} \cup P_{l_3}$, where P_{l_i} is the path on l_i vertices$(i = 1, 2, 3)$, and v is the vertex of degree 3. It was proved that $T(l_1, l_2, l_3)$ is determined by its adjacency spectrum if and only if $(l_1, l_2, l_3) \neq (l, l, 2l - 2)$ for any integer $l \geq 2$. Also it was shown that starlike trees are determined by their Laplacian spectrum. In this paper, we show that T-shape trees are determined by their signless Laplacian spectrum.