On the Wiener index for iterated line graphs of trees

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Let G be a graph. The sum of all distances in G is called the Wiener index of G and it is denoted by $W(G)$. The i-iterated line graph of G, $L^i(G)$, is $L^i(G) = L(L^{i-1}(G))$, where L is the line-graph operator and $L^0(G) = G$. Let T denote a tree. It is known that $W(L(T)) \neq W(T)$, while $W(L^2(T)) = W(T)$ has infinitely many solutions. Dobrynin and Melnikov conjectured that $W(L^i(T)) = W(T)$ has no solution if $i \geq 3$. We disproved this conjecture and we characterized all i's and T's, $i \geq 3$, satisfying $W(L^i(T)) = W(T)$.