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The unimodality of the independence polynomials of trees with non-regular structure.

The *independence polynomial* $I(G, x)$ of a graph G is the polynomial in variable x in which the coefficient a_n on x^n gives the number of independent subsets $S \subseteq V(G)$ of vertices of G . We say that $I(G, x)$ is *unimodal* if there is an index μ such that $a_0 \leq a_1 \leq \cdots \leq a_{\mu-1} \leq a_\mu \geq a_{\mu+1} \geq \cdots \geq a_{d-1} \geq a_d$. While the independence polynomials of many families of graphs with highly regular structure are known to be unimodal, little is known about less regularly-structured graphs. We analyze the independence polynomials of a large infinite family of trees without regular structure and show that these polynomials are unimodal through a combinatorial analysis of the polynomials' coefficients. (Received August 24, 2017)