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Art M Duval, Joshua Hallam* (hallamjo@msu.edu), **Jeremy L Martin** and **Bruce E Sagan**. *Increasing Forests in Graphs and Simplicial Complexes*. Preliminary report.

Let G be a graph on a totally ordered vertex set labeled by $\{1, 2, \dots, n\}$. We say a subtree of G is increasing if the vertices along any path starting at its minimum vertex increase in this ordering. Let f_k be the number of spanning forests of G with k edges such that each component is increasing. We show that the increasing spanning forest generating function,

$$IF(G, t) = \sum_{k=0}^{n-1} (-1)^k f_k t^{n-k}$$

always has nonnegative integer roots regardless of the ordering on the vertices. Moreover, we show that the increasing spanning forest generating function of G is equal to the chromatic polynomial of G if and only if the ordering on the vertex set is a perfect elimination ordering. We finish by discussing the generalization of these ideas to simplicial complexes. (Received September 03, 2014)