

Abstract Submitted
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Wind-Induced Damage Propagation in a Branched Tree Forest.

OLUWAFEMI OJO, KOUROSH SHOELE, FAMU-FSU College of Engineering — During storms and hurricanes, many destructions occur in forests as a result of wind interaction with tree canopies. The extent of the damage depends on wind gusts and interaction between trees on one hand, and their collective effect on the flow on the other hand, which makes the prediction of the damage pattern of trees challenging. A key survival character of trees subjected to wind-induced stresses is their ability to reconfigure their shapes to reduce the drag forces on them. The survival of trees in these conditions depends on the tree flexibility, cross-sectional changes in the branching nodes, slenderness, and canopy effect. In this study, we investigate the flow interaction with a forest of fractal branched trees to predict the propagation of damage that occurs and investigate the resulting flow field in different storm conditions. Also, a tree breakage model is incorporated into our simulations to study the progressive damage propagation in each tree and in the forest.

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