

Abstract Submitted
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Mechanics of a leaf detaching from tree TIM ZEHNBAUER, SUNGH-WAN JUNG, Virginia Tech — Deciduous trees shed their leaves through an abscission process. The abscission zone is formed at the base of the petiole, and consists of a top layer with weak walls and a bottom layer that expands and breaks the walls of the cells in the top layer. Although this process is well understood biologically, the mechanical principles underlying this shedding have received little attention. In the present study, we characterize the stress-strain relation of the petiole-branch connection failure over the seasons. The testing is done with a 1kN load cell, where the stem is pulled directly from the branch to make a stress-strain curve. The slope of the stress-strain curve, Youngs modulus, is obtained using least squares linear regression of the curve. We show that Youngs modulus stays constant from spring to late fall, while the maximum tensile strength falls. We are investigating the role of the shape of a leafs petiole in this behavior.

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