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On the fluid-structure interaction of synthetic leaves. WING LAI, DAN TROOLIN, TSI Incorporated, SUN JIAO, SHYUAN CHENG, LEONARDO CHAMORRO, University of Illinois at Urbana-Champaign — The dynamics of a series of synthetic leaves and induced turbulence were studied experimentally in a wind tunnel for Cauchy numbers resembling those observed in nature. We use digital image correlation, high-frame-rate particle image velocimetry, and a high-resolution load cell to track the structure motions, flow field, and forces on the synthetic leaves. Here, we will discuss some features of the techniques and distinct behavior of the structures and wake flow in response to various incoming flows. Particular emphasis is placed on characterizing flow instability, the role of leave shape on the structure motions; for this purpose, we used low-order decomposition to uncover modulating mechanisms..

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