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Roughness receptivity in swept-wing boundary layers - Computations[1] HELEN REED, RICHARD RHODES, WILLIAM SARIC, Texas A&M University, College Station, TX — The laminarization of a swept-wing boundary layer by the introduction of passive spanwise-periodic roughness elements (DREs) near the leading edge is investigated at chord Reynolds numbers of approximately 7.5 million. The Texas A+M Flight Research Lab (FRL) is currently conducting flight tests of a 30-degree swept-wing model (SWIFT) mounted vertically below the port wing of a Cessna O-2A Skymaster. As a companion to the flight experiments, the current study is concerned with modeling the flowfield over the O-2 aircraft with the SWIFT model. The full-aircraft computational model was used to validate the flight-test configuration, as well as provide the basic state for the nonlinear parabolized stability equation (NPSE) formulation used to correlate shear-stress measurements, disturbance velocity amplitude, and roughness Reynolds number, and determine the efficacy of the DREs.

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Helen Reed
Texas A&M University, College Station, TX

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