

Abstract Submitted
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The Effect of Moderate Freestream Turbulence on Crossflow Instability and Transition¹ ROBERT DOWNS, EDWARD WHITE, Texas A&M University — Previous research indicates that the generation of stationary and traveling crossflow modes is dependent on the level of freestream turbulence, Tu . Recent experiments in low turbulence environments have also shown that the initial amplitudes of stationary crossflow disturbances arising from surface roughness are influenced by small variations in Tu . Preliminary results are presented concerning experimental investigation into the role of moderate levels of freestream turbulence ($Tu = 0.025\% - 0.2\%$) in boundary layer receptivity to surface roughness. Transition induced by crossflow instability is studied using a 45-degree swept wing model in the low turbulence Klebanoff-Saric Wind Tunnel. Naphthalene flow visualization is used to assess transition location and detailed hotwire anemometry measurements are made to quantify these initial disturbance amplitudes.

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