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Stability of the boundary layer on a compliant rotating disc SHARON STEPHEN, JO-ANNE JOHN, University of Birmingham — Transition to turbulence of the three-dimensional boundary layer on a rotating disc can be preceded by the emergence of crossflow vortices that are stationary with respect to the disc. These result from an inviscid instability mechanism associated with an inflexion point in the boundary layer velocity profile or a mechanism induced by the balance between viscous and Coriolis forces. Past studies for other flows have shown that compliance can substantially postpone the onset of transition. We use numerical and asymptotic methods to investigate the effect of compliance on this instability by considering the flow over a rotating finite depth viscoelastic layer. Growth rates are calculated and neutral solutions produced for both inviscid and viscous modes. The results obtained are compared to recent experiments.

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