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The development of spiral instabilities in the boundary layer on a rotating sphere SOPHIE CALABRETTO, JIM DENIER, Macquarie University
— The unsteady flow generated due to the impulsive motion of a sphere is a paradigm for the study of many temporally developing boundary layers. The boundary layer is known to exhibit a finite-time singularity at the equator, which manifests as the ejection of a radial jet, preceded by a toroidal starting vortex pair, which detaches and propagates away from the sphere. The radial jet subsequently develops an absolute instability, which propagates upstream towards the spheres surface. This talk will present new results on the existence of vortex instabilities in the boundary layer, considering the global stability of the temporally and spatially developing flow in regimes where separation of temporal and spatial scales prohibits the use of classical techniques from hydrodynamic stability theory.

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