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The post-singularity structure in the boundary-layer flow induced by a rotating sphere JIM DENIER, SOPHIE CALABRETTO, Macquarie University — The flow induced by a rotating sphere has long held the interest of fluid mechanists. This simple flow provides a paradigm for the study of colliding boundary layers; in the case of the sphere the boundary-layer collision occurs when fluid is advected from the poles to the equator. The collision process is the physical manifestation of a finite-time singularity in the boundary-layer equations. Here we will present new experimental and computational results which demonstrate that the collision process results in a smooth separation of flow within the boundary layer at the equator and into a radial jet. Our results demonstrate that existing theories for the post-singularity structure do not provide an accurate description of the flow.

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