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Axisymmetric Afterbody Test Case for CFD Validation KEVIN DISOTELL[1], Flow Physics and Control Branch, NASA Langley Research Center, CHRISTOPHER RUMSEY, Computational AeroSciences Branch, NASA Langley Research Center — As simulation complexity increases, the corresponding need for systematic, high-fidelity validation data sets continues to be important to advance physics-based CFD models. To this end, a parametric body of revolution is proposed as an experimental platform to support a wide validation domain for turbulent boundary layers outside the current bounds of DNS. Recognizing the challenges of detailed flow exploration on complex 3-D geometries, an analytically-defined body of revolution is pursued as a tractable, state-of-the-art measurement case for complex turbulent flows having extra rates of strain. The central feature of the concept based upon work by Presz Jr. & Pitkin [J. Aircraft **11**, 677 (1974)] is an interchangeable afterbody which can be tailored to distort a turbulent boundary layer in various ways, with incoming properties controlled by the forebody. An introduction to the test case design and overview of recent progress focused on smooth-body, turbulent separation physics are presented.

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