Abstract Submitted
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High Reynolds Number Flows about Bodies of Revolution[1] JUAN JIMENEZ, University of Pennsylvania, ALEXANDER SMITS, Princeton University — Measurements were conducted in the wake of a DARPA SUBOFF submarine model at a large range of Reynolds numbers based on model length, $1.1 \times 10^6 \leq \mathrm{Re_L} \leq 25 \times 10^6$, along the centerline of the wake for 5 different locations. The model is an axisymmetric body without appendages (fins) supported by a streamlined support. In addition, the pressure was measured at 45 different locations along the surface of the model. For all Reynolds numbers studied, the mean velocity distribution becomes self-similar between 3 and 6 diameters, D, downstream for the side where the support is not located. In contrast, none of the Reynolds stresses attain self similarity. For the higher Reynolds numbers studied the presence of the support introduces an asymmetry into the wake which results in the overall decrease of radial and axial turbulence intensities for the support side. Also, the coefficient of pressure, $\mathrm{C_P}$, distribution along the top meridian line of the model, $r/D > 0$, is generally lower for $\mathrm{Re_L} = 1.1 \times 10^6$ than that for $\mathrm{Re_L} = 12 \times 10^6$ and 25×10^6, which seem to have collapsed.

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