

Abstract Submitted  
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**High Reynolds Number Studies in the Wake of a Submarine**

**Model** JUAN JIMENEZ, Princeton University, RYAN REYNOLDS, University of Southampton, ALEXANDER SMITS, Princeton University — Results are presented from submarine wake studies conducted in Princeton Universitys High Reynolds Number Test Facility (HRTF). Compressed air is used as a working fluid enabling Reynolds numbers based on length of up to  $10^8$ , about 1/5 of full scale. Measurements at Reynolds numbers up to  $3 \times 10^6$  have been completed, and show that, for the model condition without fins, the wake mean velocity was self-similar at locations 6 and 9 diameters downstream. Also, PIV at Reynolds numbers near  $10^4$  showed that when the yaw angle was varied the sail-tip and sail-hull junction vortices increased in magnitude emphasizing the importance of fully understanding the flow characteristics of a maneuvering submarine.

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