

Abstract Submitted
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Computational Modeling of the Dolphin Kick in Competitive Swimming¹ A. LOEBBECK, R. MITTAL, H. DONG, The George Washington University, R. MARK, USA Swimming, G. BHANOT, R. WALKUP, IBM Research, TJ Watson Research Center — Numerical simulations are being used to study the fluid dynamics of the dolphin kick in competitive swimming. This stroke is performed underwater after starts and turns and involves an undulatory motion of the body. Highly detailed laser body scans of elite swimmers are used and the kinematics of the dolphin kick is recreated from videos of Olympic level swimmers. We employ a parallelized immersed boundary method to simulate the flow associated with this stroke in all its complexity. The simulations provide a first of its kind glimpse of the fluid and vortex dynamics associated with this stroke and hydrodynamic force computations allow us to gain a better understanding of the thrust producing mechanisms.

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