

Abstract Submitted
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Mechanics of Mammalian Swimming TIMOTHY WEI, PAUL LEGAC, Rensselaer Polytechnic Institute, FRANK FISH, West Chester University, TERRIE WILLIAMS, University of California - Santa Cruz, RUSSELL MARK, USA Swimming, SEAN HUTCHISON, King Aquatics — Propulsion of large mammals (*i.e.* dolphins and humans) has been of great interest for both technological and athletic reasons. The foundational question is how fast can a mammal swim? Digital Particle Image Velocimetry (DPIV) has been modified to be safely used on swimmers and dolphins. Experiments of dolphins performing various swimming behaviors were performed at the Long Marine Laboratory, University of California, Santa Cruz. Vortices generated by the dolphins' tail motions were used to estimate thrust production. Also, a two-dimensional dynamic force balance was constructed to study and improve the mechanics of elite swimmers. Paired with an underwater video camera, the forces seen could be directly related to the motion of the swimmer. These force measurements could be correlated to time resolved DPIV measurements of flow around the swimmers. Measurements made with swimmers, Megan Jendrick (2000 Olympic gold medalist) and Ariana Kukors (4x US National Champion), as well as data from trials with two dolphins will be presented.

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