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Examination of Scuba Fin Designs Using Simultaneous Force and DPIV Measurements LORI HALVORSON, ERICA SHERMAN, CHIAMIN LEONG, TIMOTHY WEI, RPI — Like many commercial products, there is a wide variety of scuba dive fins on the market, each one of which, the designers argue are the best and most efficient. The foundation for these claims invariably are based on some sort of hydrodynamic argument with the full spectrum of scientific credibility attached. In this study, we examine a number of commercially available scuba fins using both DPIV of the fin motion as well as dynamic force measurements of thrust generated by a swimmer kicking against a stationary force balance. Both techniques have been used and reported in the past for studies of world class swimmers and dolphins. This will be the first time that high quality data has been obtained of both flow and force simultaneously. A number of different fin designs were tested. But the most interesting comparison was between the “monofin” and the “split-fin” designs. A discussion of the relative merits of the two different designs will be presented along with video footage showing flow and force overlaid on the fin motions.

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