Hydrostatic and Hydrodynamic Characteristics of Swimming Animals-An Inspiration for Hybrid Buoyant Aircraft

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Abstract

In today’s world, the biological sciences are mostly considered separate from the existing modern knowledge of various other fields of sciences and engineering; however there are many properties of nature and known facts of biological sciences that can be proved in the other domains of science and technology as well. Correlation of the geometric and buoyant properties of the swimming animals with the hybrid buoyant air vehicles is an example of this hypothesis. In the present work, some experiments related to the geometric parameters of a California sea lion were carried out. It was found that the fineness ratio of this animal is of the same order as the optimum value of that for the condition of minimum drag and power required for buoyant aerial vehicle. Role of multiple fins on the elongated bodies of shark is also discussed for its application for yaw stability as well as to shroud the antennas that are used in the aircraft for various communication systems.