

3D Profile variety Measurement of Pectoral Fin in Fish Fast start

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Summary

Fast-starts are brief, sudden accelerations used by fish during predator-prey encounters. In this paper, a three-dimensional (3D) test and analysis method is critical to understand the function of the pectoral fin during maneuvers. An experiment method based on Fourier Transform Profilometry for 3D pectoral fin profile variety during fish maneuvers is proposed. This method was used in a carp fast-start during prey. Projecting the moiré fringes onto a carp pectoral fin it will produce the deformed fringe patterns contain 3D information. A high speed camera captures these time-sequence images. By Fourier transform, filter, inverse Fourier transform and unwrap these phase maps in 3D phase space, the complex pectoral fin profile variety were really reconstructed. The present study provides a new method to quantify the analysis of kinetic characteristic of the pectoral fin during maneuvers.

