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Wake shed by an accelerating carangiform fish SHANG-CHIEH TING, Department of Power Mechanical Engineering, National Tsing Hua University, Taiwan, JING-TANG YANG, Department of Mechanical Engineering, National Taiwan University, BIOMIMETIC ENGINEERING LAB TEAM — We reveal an important fact that momentum change observed in the wake of an accelerating carangiform fish does not necessarily elucidate orientations of propulsive forces produced. An accelerating Crucian Carp (*Carassius auratus*) was found to shed a wake with net forward fluid momentum, which seemed drag-producing. Based on Newton's law, however, an accelerating fish is expected to shed a thrust wake with net rearward fluid momentum, rather than a drag wake. The unusual wake pattern observed is considered to be resulted primarily from the effect of pressure gradient created by accelerating movements of the fish. Ambient fluids tend to be sucked into low pressure zones behind an accelerating fish, resulting in forward orientations of jets recognizable in the wake. Accordingly, as to an accelerating fish, identifying force orientations from the wake requires considering also the effect of pressure gradient.

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