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Flow Structures and Efficiency of Swimming Fish school: Numerical Study YUZURU YATAGAI, Graduate School of Information Sciences, Tohoku University, YUJI HATTORI, Institute of Fluid Science, Tohoku University — The flow structure and energy-saving mechanism in fish school is numerically investigated by using the volume penalization method. We calculate the various patterns of configuration of fishes and investigate the relation between spatial arrangement and the performance of fish. It is found that the down-stream fish gains a hydrodynamic advantage from the upstream wake shed by the upstream fish. The most efficient configuration is that the downstream fish is placed in the wake. It reduces the drag force of the downstream fish in comparison with that in solo swimming.

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