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Vortex interaction between two tandem flexible propulsors[1] SUNG GOON PARK, HYUNG JIN SUNG, Department of Mechanical Engineering, KAIST, FLOW CONTROL LABORATORY TEAM — Schooling behaviors of flying and swimming animals are widespread phenomena in nature. Inspired by schooling behaviors of swimming jellyfish, self-propelling flexible bodies with a paddling-based locomotion were modeled in a tandem configuration. The interactions between surrounding fluids and propulsors were considered by using the immersed boundary method. The hydrodynamic patterns generated by the interactions between tandem flexible propulsors were analyzed in the presen study. As a result of the flow-mediated interactions between them, stable configurations were formed spontaneously in which the gap distance between propulsors increased and decreased during the contraction and relaxation phases of the upstream propulsor. The stable configuration was not affected by the initial gap distance but influenced by the phase difference in the flapping frequency between them. Both tandem propulsors benefited from the tandem configuration in terms of the locomotion as compared with an isolated propulsor.

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