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MicroPIV measurements of flows induced by achiral microswimmers[1] JAMEL ALI, FAMU-FSU College of Engineering, LIYUAN TAN, XIANGCHENG SHI, Southern University of Science and Technology, DALHYUNG KIM, Southern Illinois University Carbondale, MIN JUN KIM, Southern Methodist University, U KEI CHEANG, Southern University of Science and Technology — We report on the low Reynolds number hydrodynamics induced by achiral microswimmers and analysis of their flow fields using particle image velocimetry. The flows produced by two types of rigid swimmers are examined. The first swimmer consists of three self-assembled magnetic beads bonded together with avidin-biotin complexes. The second swimmer consist of thin geometries in the shape of the letter 'L' produced though photolithography and thin-film deposition. Both swimmers were wirelessly actuated in precessing magnetic fields using electromagnetic coils positioned in an approximate Helmholtz configuration. A high speed camera was used to capture the motion of fluorescent seeding particles as well as track the rotation of the microswimmers. Analysis of microPIV data revealed microvortices produced during swimming, while the magnitude of the local flows scaled linearly with increasing rotation rate. The attractive and repulsive flows observed may be useful for applications such as non-contact micro manipulation and assembly/disassembly of modular swimmers.

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