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Magnetic properties of self propelled particles MELISSA FERRARI, MICHELLE DRISCOLL, New York University, JEREMIE PALACCI, University of California, San Diego, STEFANO SACANNA, DAVID PINE, PAUL CHAIKIN, New York University — We study a class of synthetic light-activated colloidal swimmers which self propel osmotically/phoretically close to a surface and self organize into dynamic clusters. Swimming is activated by a photocatalytic hematite cube exposed from the colloidal surface. Hematite is a canted antiferromagnet, with a permanent magnetic moment; the magnetic moment is oriented in a discrete number of directions relative to the exposed hematite face. The permanent moment allows us to orient and direct the swimmers motion with an applied magnetic field, and different field configurations allow for a large range of directed motion. Furthermore, the various orientations of the magnetic moment give rise to distinct species of swimmers, which can simultaneously undergo clockwise and counterclockwise orbits in a rotating magnetic field.

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