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Surface wave assisted assembly of multi-segment magnetic structures ALEXEY SNEZHKO, IGOR ARANSON, WAI-KWONG KWOK, Materials Science Division, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, IL 60439 — A new type of multi-segment magnetic self-assembled structures induced in a magnetic granular media at the surface of water by an alternating magnetic field is reported. We demonstrate that these structures are directly related to surface waves in the liquid generated by the collective response of magnetic microparticles to the alternating magnetic field. A large-scale vortex flows are generated in the vicinity of the generated structure. The flow can be as fast as 2cm/sec and depends on the magnetic field parameters. In addition, the segments of magnetic “snake” exhibit long-range antiferromagnetic ordering mediated by the surface waves, while each segment is composed of ferromagnetically aligned chains of microparticles.

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