

Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

The self-propulsion of a helix in granular matter ROGELIO VALDES, VERONICA ANGELES, ELSA DE LA CALLEJA, ROBERTO ZENIT, Univ Nacl Autonoma de Mexico — The effect of the shape of helicoidal on the displacement of magnetic robots in granular media is studied experimentally. We quantify the influences of three main parameters of the shape of the helicoidal swimmers: body diameter, step, and the angle. We compare the experimental measurements with an empirically modified resistive force theory prediction that accounts for the static friction coefficient of the particles of the granular material, leading to good agreement. Comparisons are also made with the granular resistive force theory proposed by Goldman and collaborators. We found an optimal helix angle to produce movement and determined a relationship between the swimmer size and speed.

Roberto Zenit
Univ Nacl Autonoma de Mexico

Date submitted: 31 Jul 2017

Electronic form version 1.4