



UC3M-ICMAT Seminar – 2014

Applied Probability and Statistics

Electro-magneto-phoresis of interacting, solid and conducting particles

Antoine Sellier (LadHyX. Ecole Polytechnique, Paris, France)

Friday, February 7, 2014
10h00, ICMAT, Aula Gris I

The low-Reynolds-number electro-magneto-phoretic migration of a collection of N solid conducting particles suspended in an unbounded and conducting Newtonian liquid and subject to uniform ambient electric field E and magnetic field B is investigated.

An asymptotic analysis is first performed for clusters consisting of distant enough spheres. In a second part of the work a quite different boundary-integral approach is advocated and implemented for arbitrary (shape, conductivity, location) particles.

For spherical particles the theoretical and numerical results reveal that particle-particle interactions deeply depend upon (E, B) and the cluster's geometry. Depending upon the addressed quantity, these interactions are either small long-range or weak short-range ones for distant spheres and likely to become strong enough to dramatically affect the migration of a particle for close enough spheres.

Instituto de Ciencias Matemáticas
Campus de Cantoblanco UAM
C/ Nicolás Cabrera 13-15
28049 Madrid, Spain
www.icmat.es