Contribution ID: **1165** Type: **Oral (Student, In Competition) / Orale (Étudiant(e), inscrit à la compétition)**

The motion of spherical particles in a simple ratcheting system with AC Fields

Tuesday, 14 June 2016 14:00 (15 minutes)

Hanyang Wang, Gary W. Slater

University of Ottawa

Ratcheting systems make it possible to control the motion of particles in such a way that it becomes possible to separate mixtures of particles on the basis of various physical properties (such as charge, size, shape, etc.). The ratcheting system that we study is a standard microfluidic channel with symmetry breaking obstacles placed periodically. Zero-mean alternating electric fields are found to lead to a net ratcheting motion of the particles, whether the field is applied along the channel's axis or perpendicular to it. The resulting particle velocities depend on the particle's size and charge, thus permitting separation. We show that it is possible to make particles move in opposite directions even though their charge is of the same sign. We then explore the possibility of using rotating electric fields, with and without channel walls. In the absence of walls, i.e. with a two-dimensional distribution of obstacles, we show that it is possible to make different particles move along different directions in the plane.

Primary author: WANG, Hanyang (University of Ottawa)

Presenter: WANG, Hanyang (University of Ottawa)

Session Classification: T2-6 Condensed Matter Theory (DTP-DCMMP) / Théorie de la matière condensée (DPT-DPMCM)

Track Classification: Theoretical Physics / Physique théorique (DTP-DPT)