

Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Dynamic simulation of dielectrophoresis in colloidal suspension

XIANJIN JIANG, NADINE AUBRY, PUSHPENDRA SINGH, New Jersey Institute of Technology — We have developed a molecular-dynamics-like method to simulate the behavior of dielectric particles suspension in electrorheological fluid subjected to both uniform and nonuniform electric fields. In this method, the force acting on the particles is calculated by differentiating the electrostatic energy with respect to the position, and the energy is computed with multiple image method. The results show that considering dielectrophoretic force (DEP) force only is not enough for the simulation of particle motion when the suspension is subjected to nonuniform electric field since particle-particle interactions are ignored. The DEP-only approximation becomes more limited for the study of particles very close to each other. Our new method accounts for both particle-field (DEP) and particle-particle interactions under near- and far-field conditions.

Nadine Aubry
New Jersey Institute of Technology

Date submitted: 11 Aug 2005

Electronic form version 1.4