

Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Generation of the sedimentation potential by rapid deceleration of a fluid jet HAN JUNG PARK, University of Tennessee at Chattanooga, ZIYAO TANG, GERALD DIEBOLD, Brown University, UNIVERSITY OF TENNESSEE AT CHATTANOOGA TEAM, BROWN UNIVERSITY TEAM — The sedimentation potential refers to the generation of a voltage in an ionic or colloidal solution as a result of motion of the ions or colloidal particles relative to the surrounding fluid. In the case of colloidal suspensions, where the density of the colloidal particles differs from that of the fluid, the effect of a body force on the suspension, generated typically either in a centrifuge or the earth's gravitational field, is to give different motion to the charged particles and the fluid, producing a distortion of the normally spherical counter charge distribution around the colloidal particles. As a result of the opposing charges attached to the particles and in the double layer in the surrounding fluid, dipoles are generated at the sites of the particles, which add to give a macroscopic voltage in the fluid. Experiments reported here show that the sedimentation potential can be generated by the rapid deceleration of a jet of colloid at a rigid surface where, again, the differential acceleration of the particles and fluid gives rise to a voltage. The voltages between a conducting surface and a metallic tube used to form the jet are found to have large signal-to-noise ratios. Park *et al.* *JOURNAL OF APPLIED PHYSICS* 116, 104908 (2014)

Han Jung Park
University of Tennessee at Chattanooga

Date submitted: 03 Dec 2014

Electronic form version 1.4