

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Wave electrophoretic trapping and chaos**<sup>1</sup> BOYD EDWARDS,  
LLOYD CARROLL, AARON TIMPERMAN, JARROD SCHIFFBAUER, JON  
MEASE, West Virginia University — Synchronized oscillating electric potentials  
are applied to a periodic array of stationary cylindrical electrodes in a stationary  
conducting viscous fluid. These potentials produce a longitudinal traveling wave that  
traps high-mobility ions and partially traps intermediate-mobility ions in periodic  
and narrowband chaotic attractors with average velocities that are commensurate  
with the wave speed. Incommensurate broadband chaotic attractors feature ascend-  
ing and descending geometric series of orbit transitions that converge at the same  
unstable trapped orbit.

<sup>1</sup>Support from NSF grant EPS-0554328.

Boyd Edwards  
West Virginia University

Date submitted: 27 Nov 2007

Electronic form version 1.4