Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

**Flow-induced currents in nanotubes: a Brownian dynamics approach** SRIRAM RAMASWAMY, Department of Physics, Indian Institute of Science, Bangalore, India, MOUMITA DAS, Division of Engineering and Applied Sciences, Harvard University., AJAY SOOD, Department of Physics, Indian Institute of Science, Bangalore, India., GARANI ANANTHAKRISHNA, Materials Research Centre, Indian Institute of Science, Bangalore, India — Motivated by recent experiments reporting that carbon nanotubes immersed in a flowing fluid displayed an electric current and voltage, we numerically study the behaviour of a collection of Brownian particles in a channel, in the presence of a flow field applied on similar but slower particles in a wide chamber in contact with the channel. For a suitable range of shear rates, we find that the flow field induces a unidirectional drift in the confined particles, and is stronger for narrower channels. The average drift velocity initially rises with increasing shear rate, then shows saturation for a while, thereafter starts decreasing, in qualitative agreement with recent theoretical studies (cond-mat/0407803) based on Brownian drag and "loss of grip". Interestingly, if the sign of the interspecies interaction is reversed, the direction of the induced drift remains the same, but the flow-rate at which loss of grip occurs is lower, and the level of fluctuations is higher.

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Date submitted: 22 Nov 2004 Electronic form version 1.4