Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Evaluation of an Electrostatic Dust Removal System with Potential Application in Next-Step Fusion Devices[1] F.Q.L. FRIESEN, Grinnell College, B. JOHN, Swarthmore College, C.H. SKINNER, L. ROQUEMORE, P.P.P.L., C. CALLE, NASA — The ability to manage inventories of dust will become increasingly important as fusion devices become larger and operate with a higher duty cycle. An electrostatic dust conveyor, originally developed to remove dust from solar panels on planetary rovers, has been tested for applicability to fusion devices. It consists of a spiral pattern of three indium tin oxide traces on a glass substrate that is biased to produce a surface electrostatic traveling wave. A digital microscope measured the particle size distribution before and after operation. The transport efficiency for different particle sizes of tungsten, carbon from an NSTX tile, fine glass spheres, and sand versus given different pre-charge voltages, pre-charge durations, driving amplitudes, and driving frequencies, will be presented. The results will be used to determine the optimal settings for a dust conveyor demonstration on NSTX.

[1]Support is provided by the U.S. DOE Contract Nos. DE AC02-09CH11466 and US DOE National Undergraduate Fellowship.

C.H. Skinner
P.P.P.L.

Date submitted: 19 Jul 2010 Electronic form version 1.4