Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Nonlinear aspects of inhomogeneous solar wind plasma[1] DASTGEER SHAIKH, Department of Physics and Center for Space Plasma and Aeronomic Research (CSPAR), The University of Alabama in Huntsville — We have developed two dimensional, time dependent, nonlinear fluid simulations of freely expanding solar wind plasma. In our computational model, the small scale solar wind fluctuations are modeled in the presence of large scale background inhomogeneous flows. The background inhomogeneous flows are treated statically, whereas the fluctuations evolve according to MHD turbulence. We find that the large scale inhomogeneity introduces intrinsic compressibility in the evolution of characteristic turbulent fluctuations. Consequently, turbulence is dominated by compressible modes over the Aflvenic fluctuations. Energy cascades are slowed down by the inhomogeneous flows which further lead to the flattening of the turbulent spectra from the usual Kolmogorov-like 5/3 law. Finally, the large scale flows tend to introduce significant deviation from Guassianiaty in the nature of anisotropic and inhomogeneous solar wind MHD turbulence.

[1]This work is partially supported by NASA grants.

Dastgeer Shaikh
Department of Physics
and Center for Space Plasma and Aeronomic Research (CSPAR),
The University of Alabama in Huntsville

Date submitted: 13 Jul 2010 Electronic form version 1.4