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Modeling & Simulation of Ionospheric Disturbances: A Novel Proposition STUART BARRON, DOMINIC BETT, MONISHA CUNNINGHAM, Claflin University, Orangeburg, SC, SUDIP SEN, College of William & Mary, Claflin University & National Institute of Aerospace — We will develop a numerical model of plasma turbulence in the presence of inhomogeneous flows. This model is novel and complete because of its inclusion of realistic spatial profiles in flows including both flow shear (first order spatial derivative of flow) and flow curvature (second order spatial derivative of flow). With these inclusions the picture of stability of various plasma instabilities and disturbances is expected to be changed drastically. The inhomogeneous parallel (magnetic field aligned) flow can actually stabilize plasma turbulence because of the new flow curvature effect. This differs from the prevalent notion that the parallel flow shear is responsible for the excitation (destabilization) of plasma turbulence. In space plasma, it is usually believed that the spatial transverse shear in the parallel flow destabilizes many low frequency oscillations and this may be the origin of low frequency oscillations and disturbances in the space.

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