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2-D Hybrid Model to Study Flow Curvature Effect on Low Frequency Plasma Turbulence[1] S SEN, National Institute of Aerospace and William Mary, VA and Bowie State University, MD, D LIN, W SCALES, Virginia Tech, VA, M GOLDSTEIN, NASA-GSFC and UMBC, MD — In this study of flow curvature effects, a two-dimensional hybrid model is used to simulate the Kelvin-Helmholtz instability (KHI). The hybrid model treats the ions as particles, and electrons as massless fluid. Pressure and resistivity are assumed as isotropic. A classical configuration for the study of KHI is investigated, i.e. transverse shear flow to uniform background magnetic field. This is thought as the most unstable situation in magnetohydrodynamic (MHD) theory. There are 50 super particles per cell in the current simulations, which number could be increased to as much as 200 in the future. The boundary is periodic along the flow direction and reflective in the perpendicular direction. The code was originally developed by the Los Alamos National Laboratory and has been successfully applied to the study of Kelvin-Helmholtz instability on the Earth's magnetopause. In this study, the code has been running on the Advanced Research Computing (ARC) platforms of Virginia Tech. Four distinct shear profiles are simulated to investigate the effects of flow curvature on the growth of the KH instability: uniform flow, linear shear without curvature, quadratic profile with positive curvature, and quadratic profile with negative curvature.

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