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Alignment of Velocity and Magnetic Fluctuations in Simulations of Anisotropic MHD Turbulence[1] C.S. NG, A. BHATTACHARJEE, Center for Integrated Computation and Analysis of Reconnection and Turbulence (CICART), University of New Hampshire, Durham, NH 03824 — There has been recent theoretical interest in the effect of the alignment of velocity and magnetic fluctuations in three-dimensional (3D) MHD turbulence with a large-scale magnetic field [Boldyrev 2005, 2006]. This theory predicts that the angle θ between the velocity and magnetic fluctuation vectors has a scaling of $\theta \propto \lambda^{1/4}$, where λ is the spatial scale of the fluctuations. There have also been simulations on 3D forced MHD turbulence that supports this prediction [Mason *et al.* 2006, 2007]. The scaling has also been tested against observations of solar wind turbulence [Podesta *et al.* 2007]. We report here simulation results based on decaying 2D turbulence. The scaling of $\theta \propto \lambda^{1/4}$ and Iroshnikov-Kraichnan scaling has also been observed within a range of time interval and spatial scales, despite the fact that Boldyrev's theory was developed for fully 3D turbulence in the presence of a strong external field. As the external field is reduced in magnitude and becomes comparable to the magnitude of magnetic fluctuations or lower, the scale-dependent alignment is weakened. Implications for observations of solar wind turbulence will be discussed.

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