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Turbulence Diagnostics in Local Interstellar Clouds from High Resolution Astronomical Spectroscopy[1] STEVEN SPANGLER, ALLISON SAVAGE, University of Iowa, SETH REDFIELD, Wesleyan University — There are 15 diffuse clouds known within about 50 light years of the Sun. These clouds consist of partially ionized plasmas, with an ionization fraction of $\simeq$ 50 %, an electron density of about 0.1 cm^{-3}, and ion temperatures from 4000 - 8000 K. High resolution spectroscopic measurements of absorption lines against nearby stars have been made for lines of several atoms and ions. From these data, the temperature can be determined, as well as a non-thermal Doppler motion which is interpreted as turbulent motions within the clouds. The rms turbulent velocity amplitude is typically about 2.2 km/sec. Using published data on spectral line widths for 32 lines of sight possessing 53 absorption components, we have examined the extent to which this turbulence possesses properties of turbulence in the solar wind, such as velocity fluctuations perpendicular to the large scale magnetic field, enhanced perpendicular-to-parallel temperature ratios, and preferential heating of ions with large Larmor radii. The data for the local interstellar clouds show no evidence of these features. We will discuss possible reasons for the differences between solar wind and local interstellar turbulence.

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