Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Effects of the Violation of Taylor's Hypothesis on Observed Turbulent Power Spectra in the Solar Wind KRISTOPHER KLEIN, GREGORY HOWES, JASON TENBARGE, Department of Physics and Astronomy, University of Iowa — All frequency measurements of magnetized turbulence in the solar wind are a convolution of temporal and spatial terms. For typical *in situ* measurements near 1 AU, the super-Alfvénic solar wind velocity motivates the adoption of Taylor's Hypothesis, in which the temporal contribution to the frequency measurement is neglected. The Solar Orbiter and Solar Probe Plus missions will sample the solar wind in the near-Sun environment where the solar wind velocity is not significantly greater than the Alfvén velocity. In this case, Taylor's Hypothesis ceases to be applicable. We make qualitative and quantitative predictions of the changes in measured turbulent power spectra due to the violation of Taylor's Hypothesis. It is shown that critically balanced Alfvén waves do not significantly alter the structure of magnetic power spectra while higher frequency fast/whistler waves do. Observed changes in measured power spectra may therefore be useful in distinguishing between competing models of solar wind turbulence.

Kristopher Klein
Department of Physics and Astronomy, University of Iowa

Date submitted: 11 Jul 2013 Electronic form version 1.4