



## **MMS Measurements using Phase Differencing Method**

Owain Walker

Aberystwyth University, Faculty of Business and Physical Sciences, Physics, Aberystwyth, United Kingdom  
(otw1@aber.ac.uk)

MMS Measurements using Phase Differencing Method

Authors:

Owain Walker, Aberystwyth University

Xing Li, Aberystwyth University

Plasma fluctuations in the Earth's magnetosheath (which has high- $\beta$  value) are investigated using NASA's magnetospheric multiscale spacecraft (MMS). At ion kinetic scales, plasma turbulence is often assumed to be a superposition of different linear waves such as kinetic Alfvén, kinetic slow and kinetic fast waves, with the latter two wave modes significantly damped at high- $\beta$ . A phase differencing method is applied to high time-resolution ion velocity, density and temperature data from the Fast Plasma Instrument as well as data from the fluxgate magnetometer of MMS. We calculate wave vectors of individual wave packets from several reconstructed time series (the reconstruction happening at a range of scales following wavelet analysis). We study the wave vector space anisotropy and dispersion properties of these fluctuations. These properties are compared to the predictions of Vlasov linear wave theory for kinetic Alfvén, kinetic slow and fast waves.