



**3D power spectral anisotropy and ion diffusion region in the wavenumber domain of plasma turbulence in the magnetosheath**

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**Abstract:** A turbulence event in the terrestrial magnetosheath is investigated with the k-filtering technique (also named as the wave telescope technique). With the high-resolution measurement of *MMS* and proper separation of the satellites, characteristics in the sub-ion region with  $kd_1$  between 2.4 and 12 are examined. We compute the Power Spectral Density of the event, with not only the magnetic field but also for the first time the electric field from *MMS* observation, and get 3D power spectral anisotropy respectively. Analogous to the ion diffusion of magnetic reconnection, we compute the detail of ion diffusion in the sub-ion region of the wavenumber domain, by comparing the output of the technique with the input as the electric field in the ion-local frame and ion-global frame. The result is generally consistent with the linear Maxwell-Vlasov prediction with kinetic Alfvén wave dominating.