

**R005-06**

**A 会場 : 11/24 PM1 (13:15-15:15)**

**14:30~14:45**

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## **Diagnosing the dynamical structure of the thermosphere using 3rd-order structure functions**

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We use multi-year observations of cross-track winds ( $u$ ) from the CHALLENGING Minisatellite Payload (CHAMP) and the Gravity Field and Steady State Ocean Circulation Explorer (GOCE) to calculate third-order structure functions in the thermosphere as a function of horizontal separation ( $s$ ). They are computed using the mean and the median and implemented over non-polar satellite paths in both hemispheres. On height averages is shown to scale with  $s^2$  for  $s \approx 80 - 1,000$  km, in agreement with equivalent estimates in the lower atmosphere from aircraft observations. Conversely, med follows an  $s^3$  power law for almost the whole  $s$  range, consistent with the two-dimensional turbulence scaling law for a direct enstrophy cascade. These scaling laws appear independent of winds in distinct atmospheric regions. Furthermore, the functions are predominantly positive, indicating a preferential cyclonic motion for the wind.