



## **Tidal signature of the mid-latitude ionospheric nighttime anomaly using CHAMP and GRACE observations**

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This paper presents a study on the tidal signatures of the mid-latitude summer nighttime anomaly (MSNA), also known as Weddell Sea anomaly in the southern hemisphere. The electron density observations by CHAMP and GRACE show clear MSNA structures in both hemispheres during local summer nighttime. A linear least squares algorithm for extracting the solar tidal components is utilized to examine the major tidal components affecting the variation of the electron density. In the southern hemisphere, we find a prominent eastward propagating wave-1 of electron density in the local time frame, which could be explained by the symmetric diurnal wave (D0) and a stationary planetary wave (SPW1) component. Conversely, in the northern hemisphere during local summer, a prominent eastward wave-2 can be found, which could be attributed to the diurnal eastward propagating wave (DE1) and a stationary planetary wave (SPW2) component. We are going to offer some explanations that may be responsible for the different appearance of the wave structures in the two hemispheres.