Height-Integrated Pedersen Conductivity in both E and F regions from COSMIC Observations

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Abstract:
The altitudinal distribution of Joule heating is very important to the thermosphere and Ionosphere, which is roughly proportional to the Pedersen conductivity at high latitudes. Using the COSMIC observations from 2008 to 2011, the height-integrated Pedersen conductivities in both E and F regions have been studied. Our result shows the ratio between the F and E region integrated Pedersen conductivities is about 1:7, which is larger than the ratio (1:10) generally expected in the auroral region. This indicates the energy input into the F region may be underestimated in empirical models. Since the electron density profile in E region from the COSMIC measurements may not be accurate, the comparison of conductivity between the COSMIC observations and empirical models has also been conducted. The variations of the ratio under different seasons and geomagnetic activity conditions have been investigated as well.