## Atmospheric density variations observed by GOCE

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Using observations from the GOCE satellite, we examined the dependence of the thermospheric density with solar flux level at different local times. The results show that at dawn there is positive correlation. The coefficient of correlation is 0.6279. At dusk positive correlation can be found. The coefficient of correlation is 0.5390. Seasonal variation of density shows maximum in spring and fall, and it shows minimum in summer. We further examined the ratio between dawn and dusk. The results show an increasing in the ratio from 2010 to 2013, however, there is only a very weak dependence on solar flux is found. We further compare these results with those obtained by CHAMP, and found the ratio between dawn-dusk, day-night thermospheric densities is a relatively stable value than is not much influentially by solar flux levels. This feature can serve as a constrain parameter for thermosphere models.

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