

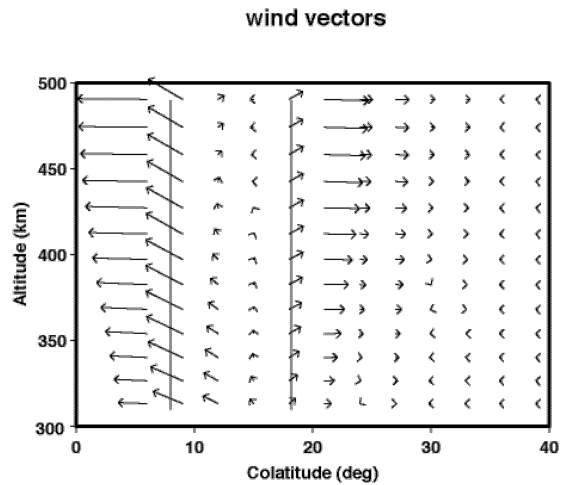
Title: *Cusp Neutral Fountain*

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- **Cusp Neutral Fountain**

Recent satellite measurements indicate that neutral density enhancements are common in the northern dayside cusp. The neutral density at 400 km in the cusp can be nearly a factor of two larger than in the poleward and equatorward sides of the cusp. The presence of density enhancements implies that the neutral atmosphere is being heated in the cusp, causing upwelling. The USU high-resolution model of the global thermosphere was used to study the thermosphere's response to heating in the northern dayside cusp. It was found that heating in the cusp results in the creation of a neutral fountain. Specifically, the upward drift of the thermosphere within the cusp region is followed at higher altitudes by both a poleward and equatorward movement out of the cusp region and the gradual subsidence of the neutral gas. Model results show density enhancements consistent with the satellite measurements for sufficiently strong heating in the cusp. Neutral temperature enhancements also occur and are strongest near the poleward and equatorward boundaries of the cusp region.



Vertical neutral winds versus altitude and co-latitude, reaching 120 m/s in the dayside cusp (left panel) and the corresponding wind vectors (right panel). Geographic pole is at 0°.

Demars, H. G. and R. W. Schunk, Thermospheric response to ion heating in the dayside cusp, *J. Atmos. Solar-Terr. Phys.*, in press, 2006.