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COMPARATIVE STUDY OF POLAR IONOSPHERIC BEHAVIOR USING GPS MEASUREMENT

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Ionospheric irregularities like Traveling Ionospheric Disturbance (TID's) and ionospheric scintillation have been of increasing technical interest in studying the effects of the ionosphere on communication and navigation systems. Ionospheric irregularities occur more often in the high-latitudes than the mid-latitudes. However, the ionospheric behaviors are different between Arctic and Antarctic, because of the difference of locality and spacial environment.

In this paper, we use the IGS and SCAR permanent GPS observations in the polar and sub-polar regions, in 2004. An ionospheric processing software developed by ourselves was used for the data processing. Results of analysis of the influence of ionosphere over the Arctic and Antarctic regions on positioning precision are presented in the paper, furthermore, the total electron content (TEC) was derived using our software. we compare the values of TEC between Arctic and Antarctic regions, as well as TEC changes. Based on these different behaviors, the physic characteristics in polar areas are analysed. It is concluded that the ionospheric feature of polar areas are quite different, and more complicated than other areas in the earth, there will be much more research on this region.