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Assessment of the Polar Cap (PC) index

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The Polar Cap (PC) index was originally introduced by Troshichev and Andrezen in order to derive the solar wind "geoeffective" (or "merging") electric field ($V_{SW} B_T \sin^2(\theta/2)$) from available polar ground-based magnetic observations. Basically, the PC index is a measure of the polar antisunward ionospheric plasma convection driven by the dawn-dusk polar cap electric field generated by the solar wind. The PC index thus provides a measure of the global magnetic activity. The development of a PC index was recommended by IAGA in 1999 and the index was later adopted by IAGA on the condition, that the derivation of PC-S (south) and PC-N (north) indices was unified, and a joint procedure for the PC index calculations was defined. The presentation will briefly explain the procedures for deriving the PC-S and PC-N indices. Further, the PC index values will be compared to values for the transpolar ionospheric current intensities derived from magnetometer observations by Oersted and other polar orbiting satellites. The two sets of index data, PC-S since 1978 and PC-N since 1966, will be compared to values of the geoeffective interplanetary electric field derived from available solar wind data in order to examine the possibilities for forecast of geomagnetic storm conditions.