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## The PC index as a ground-based indicator of the solar wind energy incoming into the magnetosphere: Means for space weather monitoring

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**P**C (Polar Cap) index was introduced as characteristic of the polar cap magnetic activity related to geoeffective interplanetary electric field EKL coupling with the magnetosphere. Examination of relationships between PC and EKL showed that the PC growth actually follows the EKL increase with delay time  $\Delta T \sim 12-20$  min. The PC index growth, in its turn, determines development of magnetospheric substorms and storms, which starts as soon as PC index reaches threshold level  $1.5 \pm 0.5$  mV/m, lasts as long as PC continues to be higher this level, and decay when PC declines. Maximal depression of geomagnetic field (Dstmin) responds, with typical delay time  $\Delta T \sim 1 \div 2$  hour, to maximum of the smoothed PC index, the values Dstmin and PCmax being connected by linear relation. Magnetic storms can be separated, according to peculiarities of the PC behavior, on "classic", "pulsed" and "composite" types, which are correspondingly related to CME and CIR solar driver and their concurrent action. These experimental facts testify that PC index serves as a proxy of the solar wind energy incoming into magnetosphere. Magnetospheric disturbances much better correlate with PC than with EKL, in spite of perfect correlation between PC and EKL. It implies that PC index provides more reliable information on solar wind impact on the magnetosphere, than EKL field derived from data fixed far from magnetosphere (on board ACE - Advanced Composition Explorer in the Lagrange point L1). Thus, the PC index ensures possibility to verify the solar wind flow transportation from point L1 (where solar wind parameters are estimated) to magnetosphere and to separate those cases, when the solar wind fixed by ACE, did not encounter with the magnetosphere. PC index might be useful in fitting the magnetosphere - solar wind coupling function and resolving other problems, which require the actual information about the solar wind energy incoming into magnetosphere.

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