



## **Modeling the ring current from polar magnetic variations**

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The polar cap indices, PCN for the northern polar cap and PCS for the southern polar cap, are derived from analysis of magnetic variations in the polar caps. The indices mainly relate to the transpolar ionospheric electric currents generated by the interaction of the solar wind with the magnetosphere. The present paper discusses the relations between the PCN and PCS indices and the interplanetary merging electric field (EM) with particular emphasis on the correlation of a combined PC index, PCC, with EM. The merging electric field closely correlates with global disturbances such as magnetic storms that are caused by the impact on the magnetosphere of the enhanced solar wind following eruptive solar activity. The new PCC index resolves the ambiguity implied in having two index series to be proxy for the same merging electric field and to represent global magnetic activity. The presentation shall demonstrate the relations between the new polar cap index and the magnetospheric ring current represented by the hourly Dst index and the SYM and ASYM 1-min indices. The Dst index can be modeled as well from using the PCC index as from using the interplanetary merging electric field intensity to form its source function. Furthermore, the observed (real) Dst index correlates better with the equivalent index modeled from the PCC index than with index values modeled from the PCN or PCS indices separately, or the auroral electrojet indices AU, AL and AE.