



MLT variations of sectorial geomagnetic activity indices: statistical and case event studies

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Solar-wind/magnetosphere interactions are not symmetric and show a local time dependency. In order to better describe this effect, we define new Magnetic Local Time (MLT) sector geomagnetic activity indices. These K-derived 3-hour indices are calculated on the basis of $\alpha\lambda$ regional sector geomagnetic activity indices (themselves derived from am network observatories) and thus reflect the geomagnetic activity at sub-auroral latitudes; homogeneous data series of MLT sector geomagnetic indices can be derived from 1959 onwards.

In this study, we consider MLT sector geomagnetic indices computed for the 03-09, 09-15, 15-21, and 21-03 MLT sectors. We present a statistical study of their variations as a function of local time, seasons, and geomagnetic activity level.

Results of an analysis of the variation of the K-derived MLT sector indices during selected storm events are also presented giving consistent properties with the statistical study. The Midnight MLT-sector indices present generally the highest amplitude during disturbed geomagnetic activity period.