



Motivations and Implications for Revising the Dst Index

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The Dst index is one of the most useful geomagnetic indices which has been constructed to monitor the most dramatic events in the near-Earth space, the geomagnetic storms. However, it has been known for some time that the Dst index includes an excessive, seasonally varying quiet-time level, the so called "non-storm component" which is unrelated to the intensity of the ring current or magnetic storms. We have recently calculated a corrected and extended version of the Dst index, the so called Dcx index for 1932-2005. Here we review the rationale for introducing the Dcx index, and discuss the properties of the Dcx index and the consequences of replacing the Dst index by the more correct Dcx index. While the time evolution of individual storms remains the same, the correction can raise their Dst values by up to 44 nT. The correction has a strong seasonal variation with maxima around the equinoxes, especially in the vernal equinox. The largest monthly correction of about 12 nT is found for March. The average increase of the Dst index is 6.0 nT for all SSC storms, implying a correction of about 23% to the average 7-day storm level, and a 14% correction to the average minimum-Dst value of 42.3 nT for all SSC storms. Thus, the correction affects many earlier storm studies and even the classification of storms to the different intensity levels. Dcx has essentially different properties compared to the Dst index. E.g., the Dcx index correlates better with both sunspots and geomagnetic indices. We discuss these and other implications of substituting the Dst index by the Dcx index.