Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11745, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11745
EGU General Assembly 2008

New Indices of Geomagnetic Activity at Test: Comparing the Correlation of the analogue ak Index with the digital Ah and IHV Indices at the Sodankyla Station

K. Mursula (1), D. Martini (1)

(1) University of Oulu, Physics Dept., Oulu, Finland (kalevi.mursula@oulu.fi)

We test here two recently proposed indices of geomagnetic activity, the Ah index and the IHV index, which are based on digitally available hourly geomagnetic measurements. We study their correlation at different temporal scales with the Sodankyla ak index that is based on analogue registrations and exists since 1914. Even at the highest temporal resolution, the 3-hourly Ah indices correlate extremely well with ak (correlation coefficient = 0.873 for 243374 points). Correlation is excellent at all local times, with correlation coefficients varying from dayside minimum of 0.81 to nightside maximum of 0.89, indicating that Ah describes the local time variability of the ak index very reliably. Using daily averages the correlation between ak and Ah is even higher (cc= 0.94) and considerably better than between ak and IHV (cc= 0.80). The standard deviation between daily averages of ak and the correlated Ah is only 6.9 nT but as large as 11.9 nT for IHV. At the monthly resolution and longer, the IHV indices correlate with ak almost equally well as Ah with ak. However, while the slopes of the best fit relations between ak and Ah are nearly the same at all temporal resolutions (yearly, monthly, daily, 3-hourly), reflecting a highly linear relation between these two indices, the slopes between ak and IHV get consistently and significantly smaller with increasing resolution, indicating a fundamentally nonlinear relation between ak and IHV. These facts verify that IHV index is very different from all K based indices, including ak and Ah, and strongly suggest that Ah rather than IHV should be used as a long-term proxy or extension of local and global ak/K indices.