

TABLE 1: DERIVATION PROCESSES OF GEOMAGNETIC INDICES

Indices (beginning of the series)	Measured quantity Base value	Time interval	Observatories situation	Method of Derivation
Auroral activity indices AE, AU, AL (since July 1957 data missing in 1976-1977)	Deviation ΔH (nT) of the horizontal component, from a base value (Sq variation)	1 minute values (since 1978)	Network of stations in the northern auroral zone Change of the network in 1966 (network since 1966 on Figure 1)	AU is the largest AH recorded in the stations of the network at a given time (Upper envelope) AL is the smallest one (Lower envelope) $AE = AU + AL $ $A0 = (AU + AL) / 2$ (unit: nT)
Equatorial Dst index (since 1957)	Deviation ΔH (nT) of the horizontal component, from a base line (secular variation)	Hourly values	Network made of 4 low latitude stations (see Figure 1)	Hourly values of the disturbance D (unit nT) are calculated for each station by: $D = \Delta H - Sq$ $Dst = (\text{average of } D) / (\text{average of cosinesof the dipole latitude of the stations})$
K indices	Amplitude of the irregular variations (base value: S_R)	Range measured on 3-hour intervals (taken from 00:00 UT)	K indices are defined everywhere, but are most significant at subauroral latitudes	K is a code (one digit 0 to 9) indicating the class of amplitude in which falls the measured range. Classes are defined on grids of amplitude with a quasi logarithmic scale a_K is the mid class amplitude in nT
Kp indices and ap, Ap (since 1932)	K indices	3-hour (UT)	Network made of 11 northern and 2 southern stations (see Figure 1)	K codes for individual stations are converted into standardised codes "3Ks" $3Kp = \Sigma 3Ks / 12$ 3Ks and 3Kp are integer values: 0 to 27 Kp values are from 0o, 0+, 1-, to 9o ap is the value in unit 2nT obtained from Kp through a conversion table Ap is the daily average of ap (unit: 2nT)
an, as and am indices Kn, Ks and Km An, As, and Am (since 1959)	Range amplitudes deduced from K indices	3-hour (UT)	Network made of 13 northern and 10 southern subauroral stations arranged in groups representing longitude sectors (see Figure 1)	For each longitude sector, averages of K are converted into range amplitudes and corrected for die differences in the extent in longitude of the sectors an is the average of those amplitude values (unit: nT) for northern stations as is the average for southern ones $am = (an + as) / 2$ Kn, Ks, Km are equivalent 'K' values obtained from the above an, as, am through a conversion table An, As, Am are daily averages of an, as, am (unit: nT)
aa indices (since 1868)	Range amplitudes deduced from K indices	calculated on 3-hour intervals valid on an half day or day basis	Network made of 2 antipodal subauroral stations	Mid class amplitudes deduced from K are corrected for small differences between the latitudes of the northern and southern stations aa is the average of these 2 amplitude values (unit: nT)