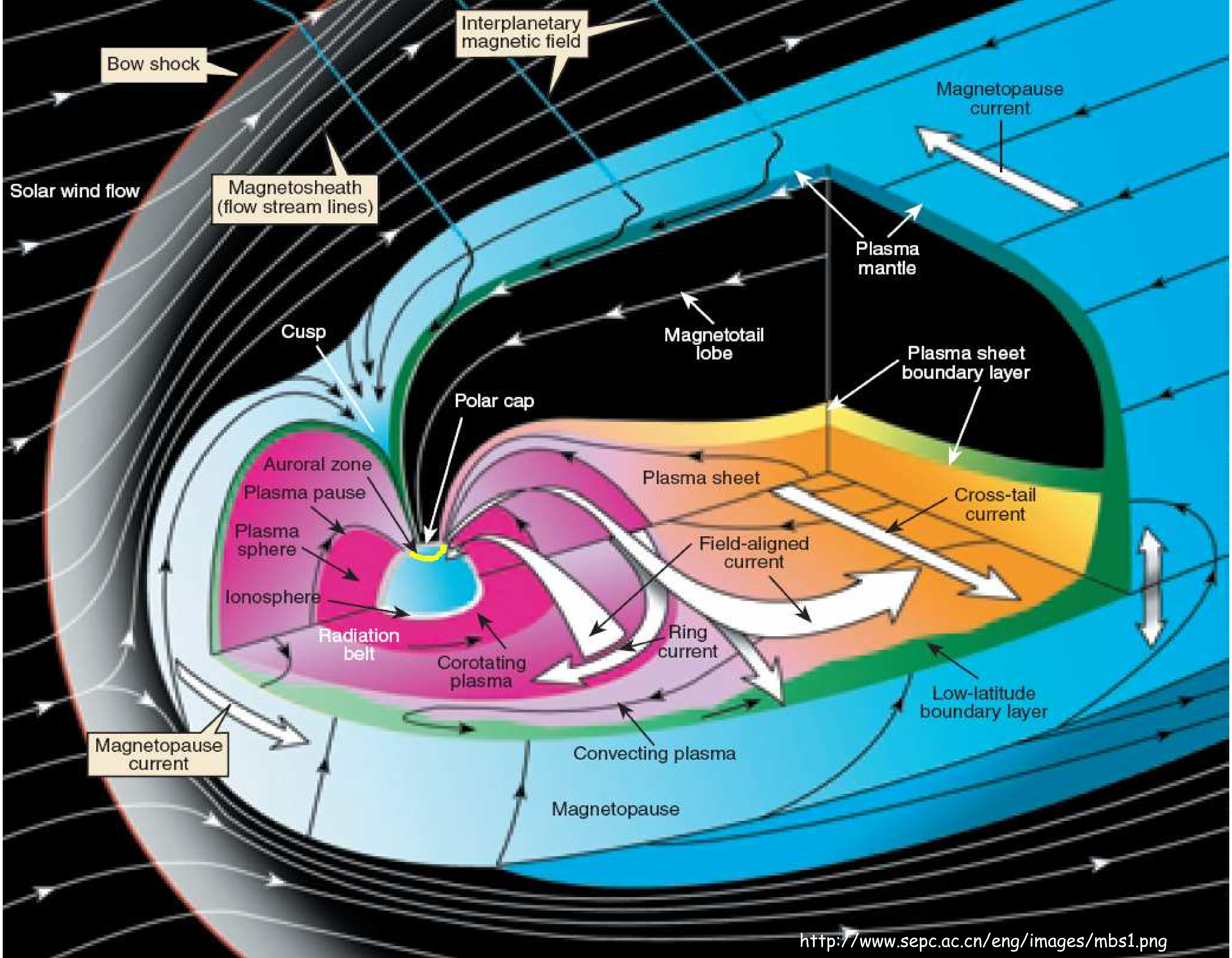
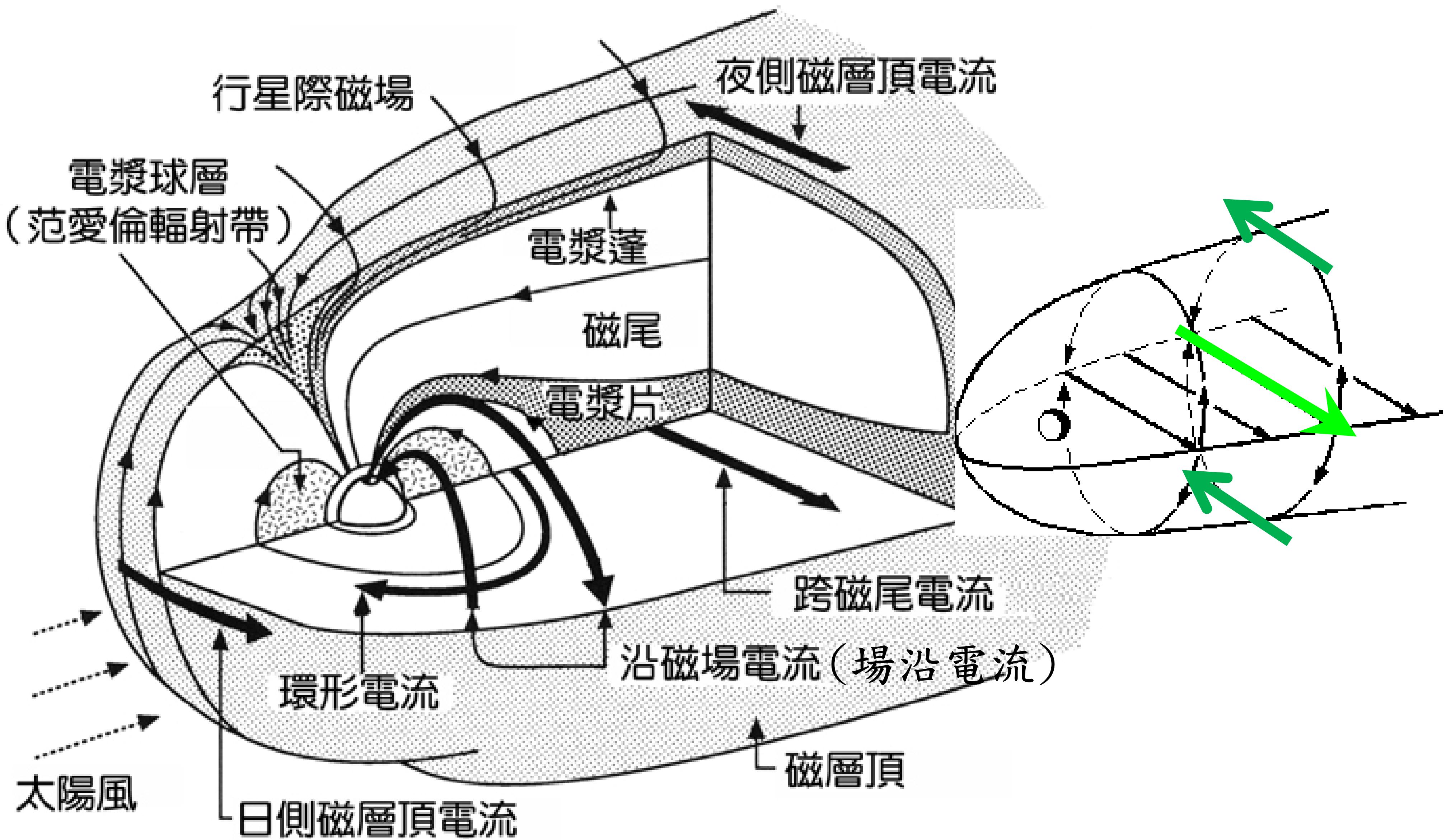


http://www.sepc.ac.cn/eng/images/mbs1.png

地球磁層電流系統



http://www.ss.ncu.edu.tw/~lyu/lecture_files/IntroSpace.html

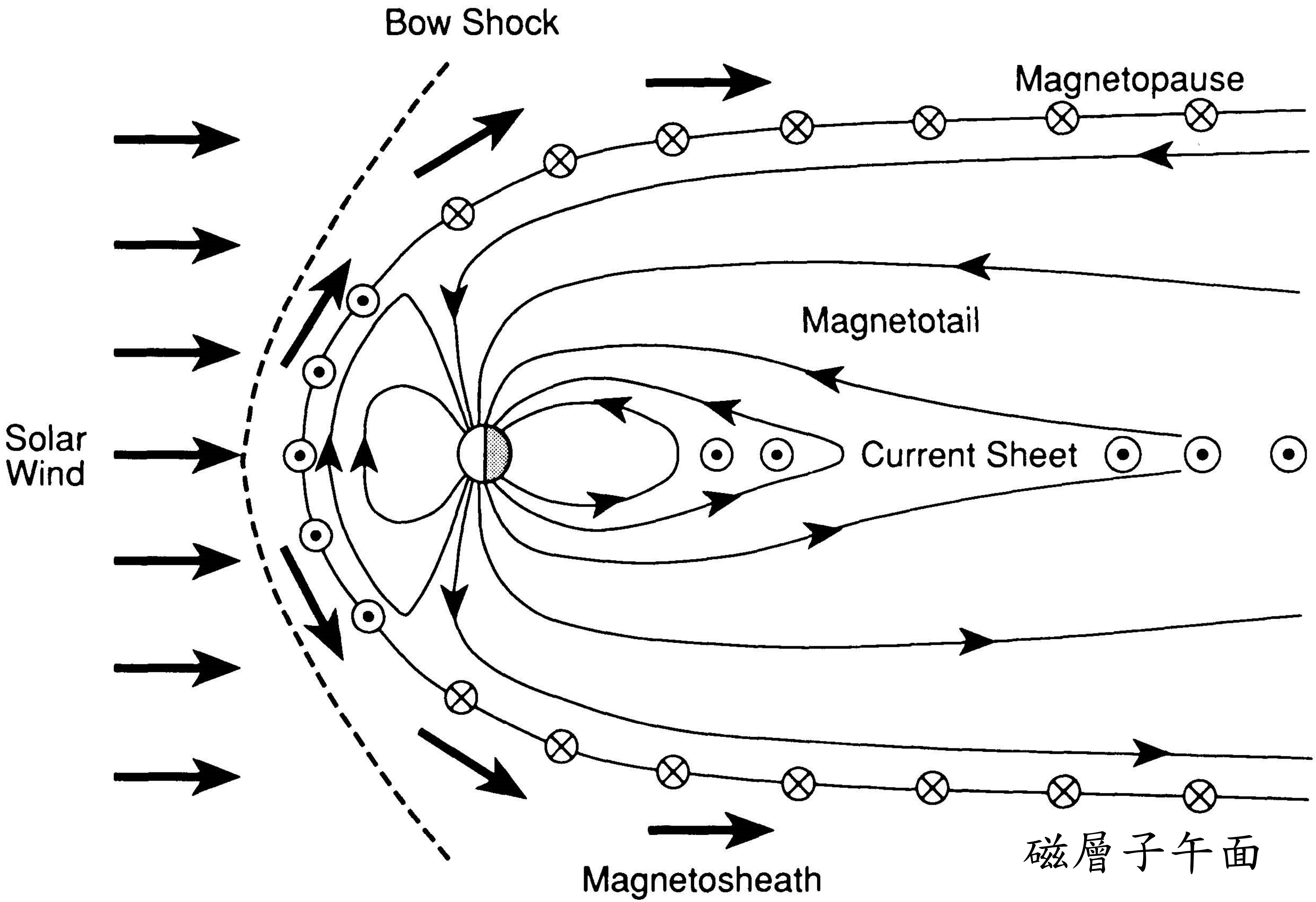
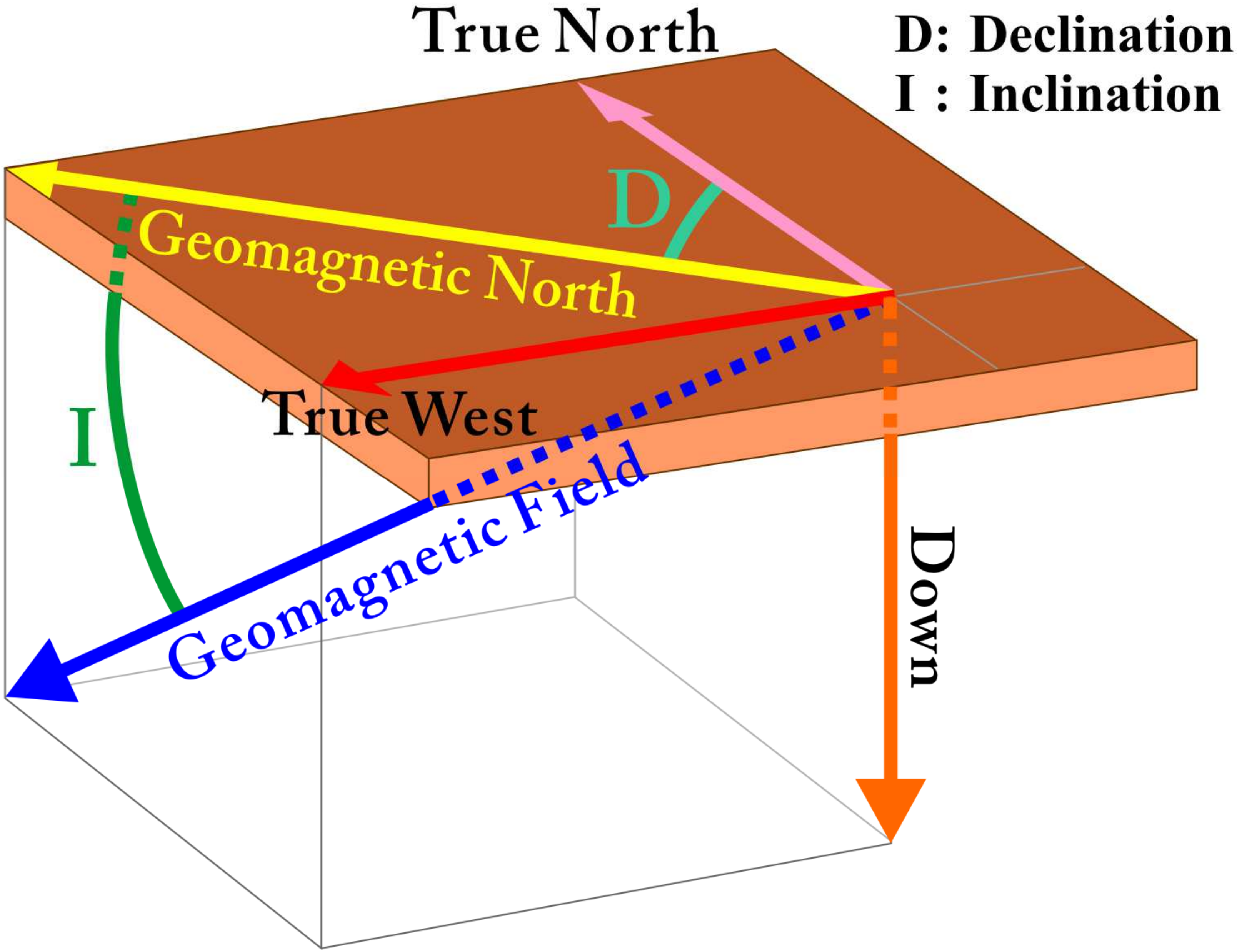


Fig. 9.1 in M. G. Kivelson and C. T. Russell (1995)

Geomagnetic Field

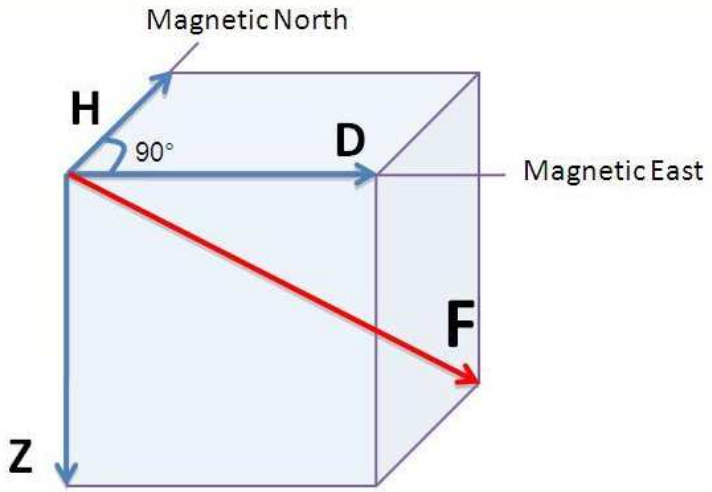


http://www.hko.gov.hk/gts/graphics/equake-graphics/geomagnetism05e.png

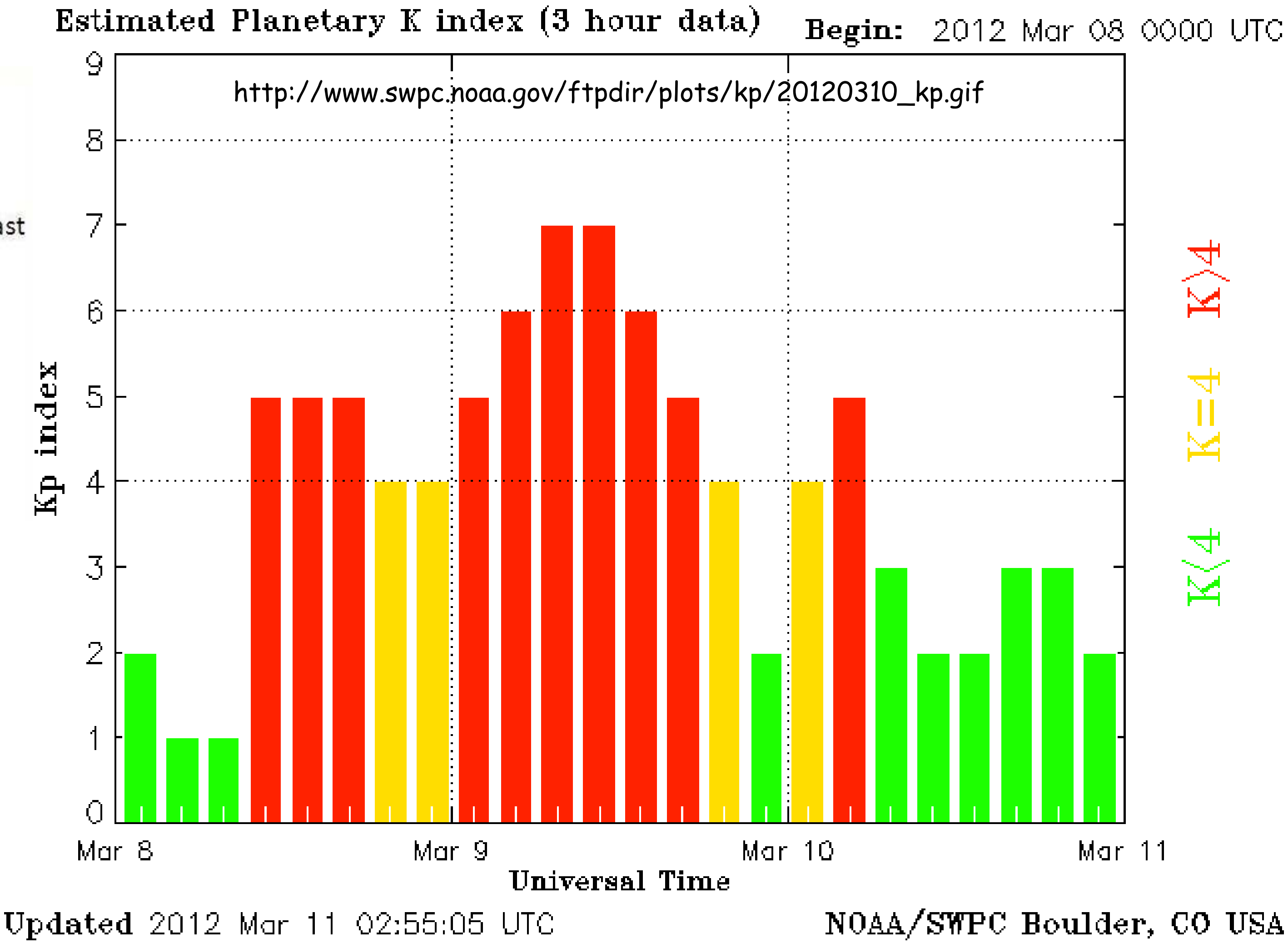
Kp Index

The Kp index is estimated from the average of the disturbance levels in the most disturbed horizontal magnetic field component (H or D) at 13 selected mid-latitude stations during three-hour period.

0o, 0+, 1-, 1o, 1+, 2-, 2o, 2+, ... , 8o, 8+, 9-, 9o

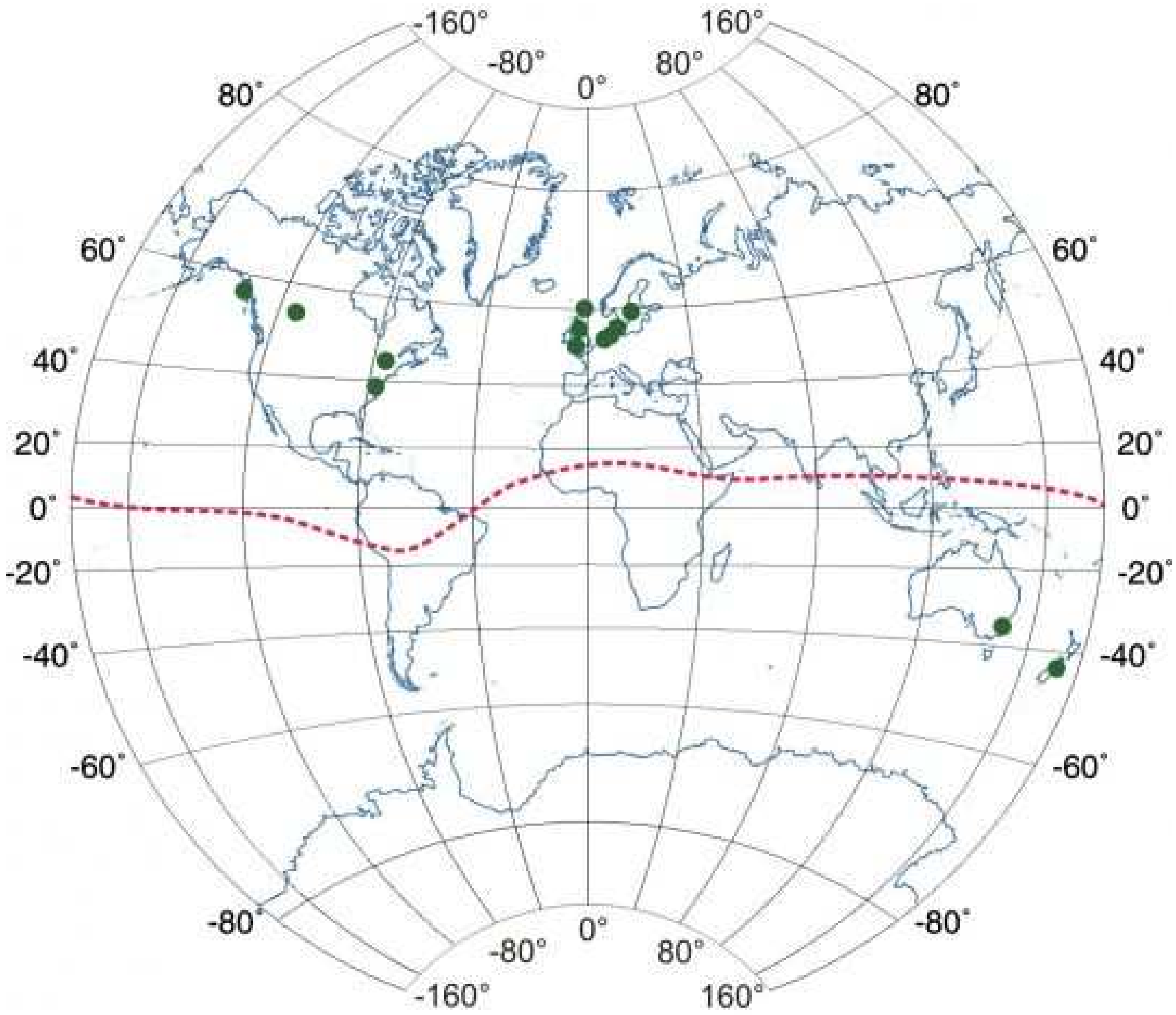


http://www.thecamino.com.ar/KPindex.htm



http://wwwuser.gwdg.de/~rhennin/kp.html

Kp Index



http://roma2.rm.ingv.it/userfiles/image/tematiche/IndiciGeomagnetici/Kp_obs.jpg

Dst (Disturbance Storm Time) Index

Dst is derived from the average of H (northward) component disturbances of the geomagnetic field measured hourly at four low-latitude magnetic observatories and is expressed in nanoteslas.

Dst is a geomagnetic index which monitors the world-wide magnetic storm level and has long been used as an indirect measure of the ring current.

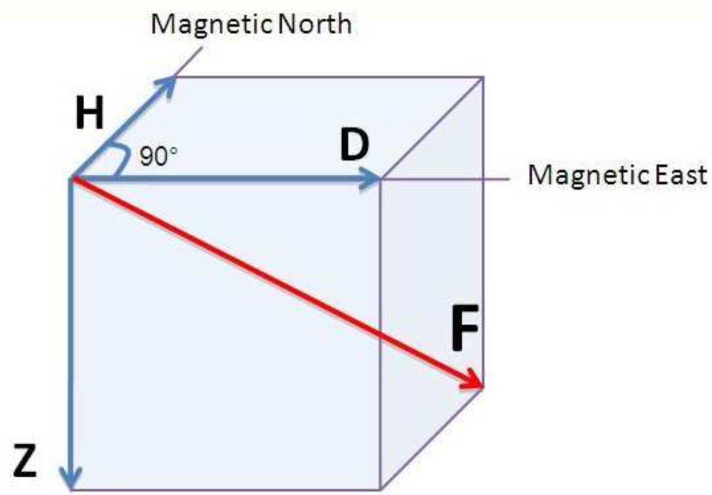


TABLE 1 - Coordinates of the Observatories

Observatory		Geographic Longitude (E)	Geographic Latitude	Geomagnetic Dipole latitude
Hermanus		19.22°	-34.40°	-33.3°
Kakioka		140.18°	36.23°	26.0°
Honolulu	to April 1960	201.90°	21.30°	21.0°
	after April 1960	201.98°	21.32°	21.1°
San Juan	to January 1965	293.88°	18.38°	29.9°
	after January 1965	293.85°	18.01°	29.9°

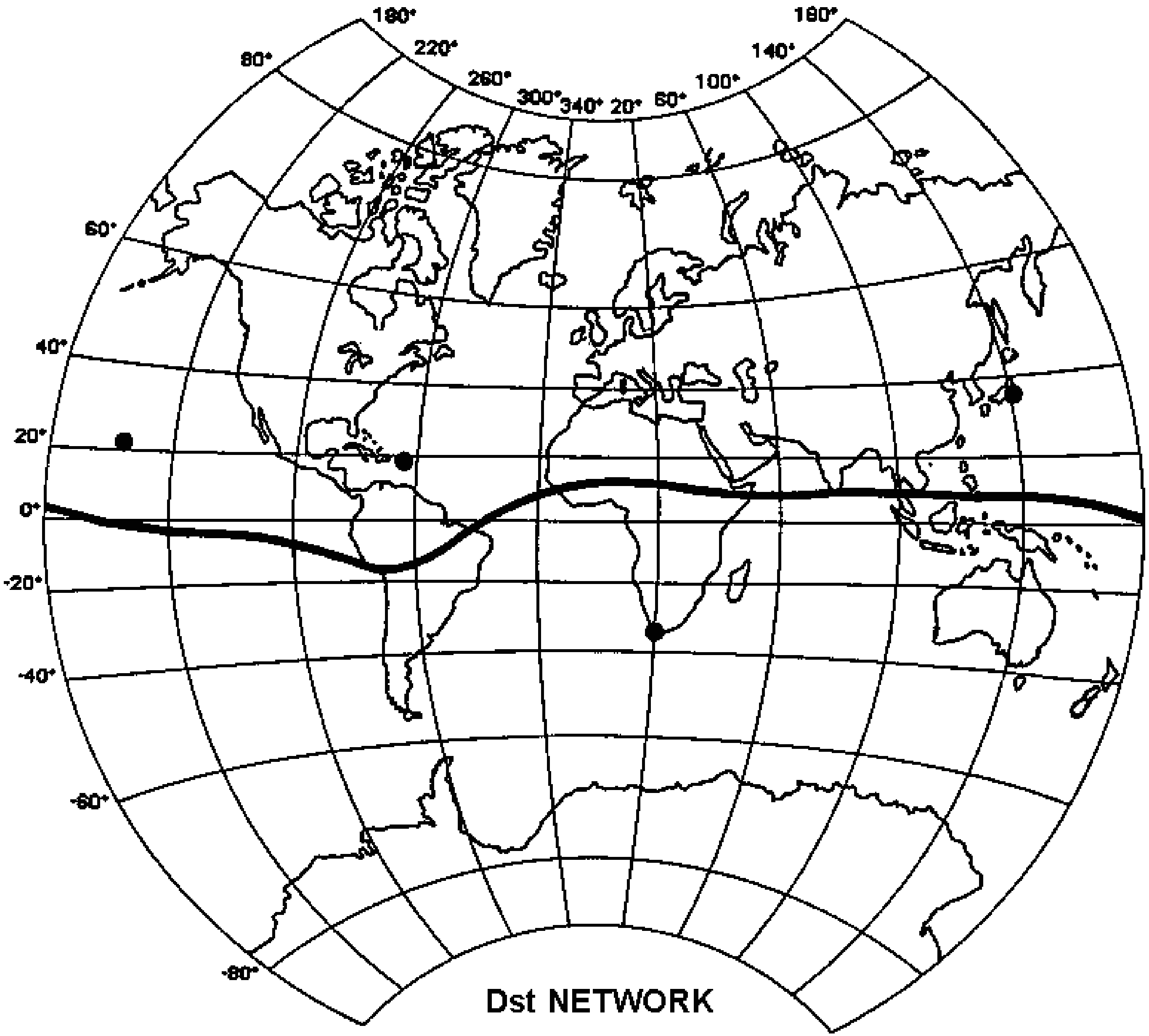
http://wdc.kugi.kyoto-u.ac.jp/dstdir/dst2/onDstindex.html

https://wiki.oulu.fi/display/SpaceWiki/Magnetic+activity+indices

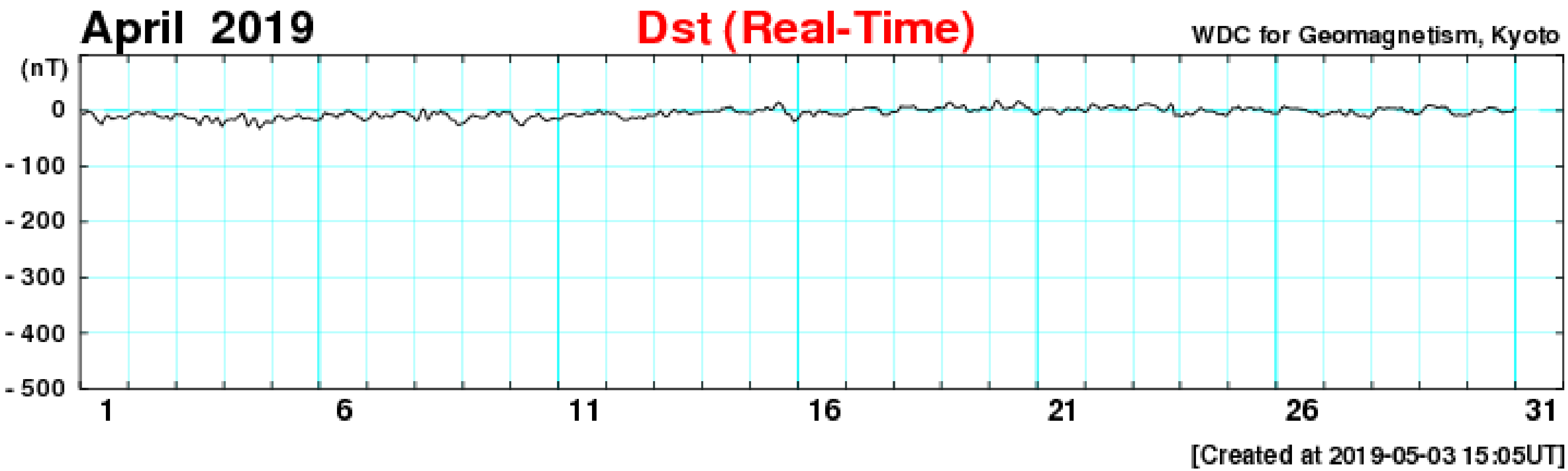
http://pluto.space.swri.edu/image/glossary/dst.html

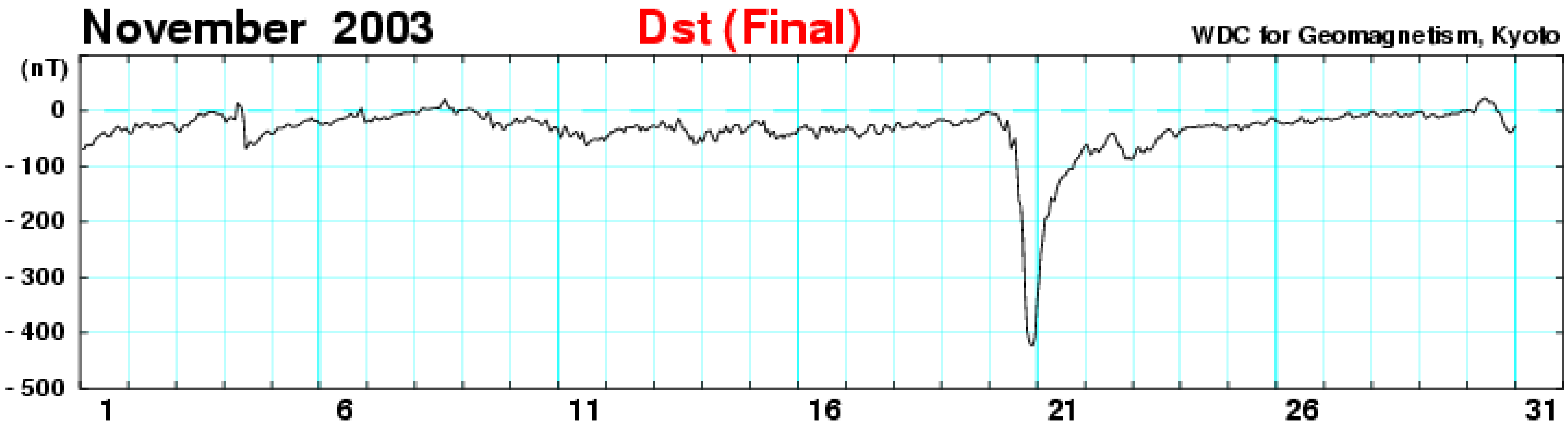
http://roma2.rm.ingv.it/en/themes/23/geomagnetic_indices/27/dst_index

Dst (Disturbance Storm Time) Index



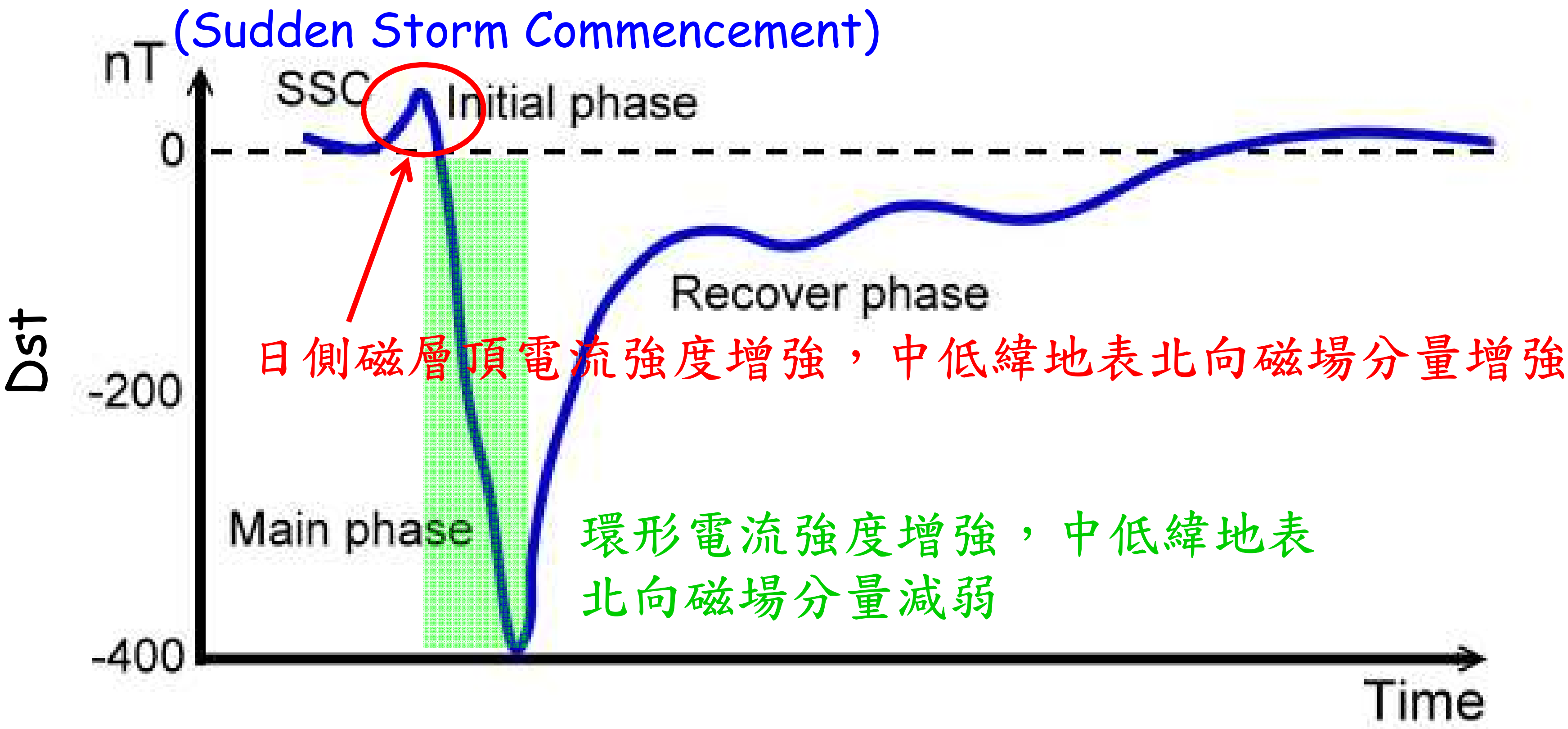
http://wdc.kugi.kyoto-u.ac.jp/dstdir/dst2/DSTnetwork.gif





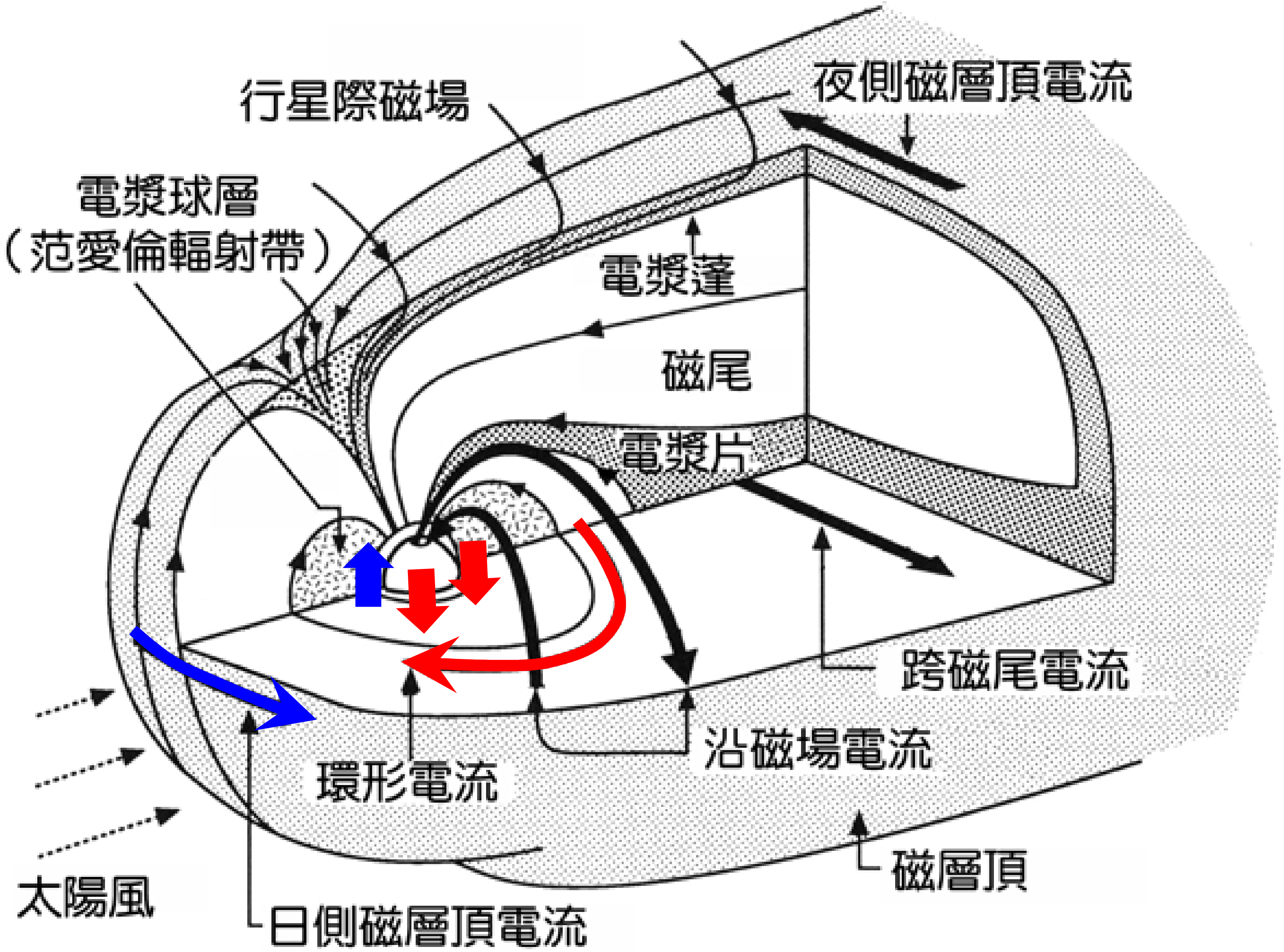
http://wdc.kugi.kyoto-u.ac.jp/dstdir/index.html

Dst (Disturbance Storm Time) Index



http://roma2.rm.ingv.it/en/themes/23/geomagnetic_indices/27/dst_index

地球磁層電流系統



http://www.ss.ncu.edu.tw/~lyu/lecture_files/IntroSpace.html

磁暴(magnetic storm)

→持續時間約3天至一個多星期

→影響地表中低緯度區域

→過程:

initial phase:

日側磁層頂內移，日側磁層頂電流強度增強，中低緯地表北向磁場分量增強

main phase:

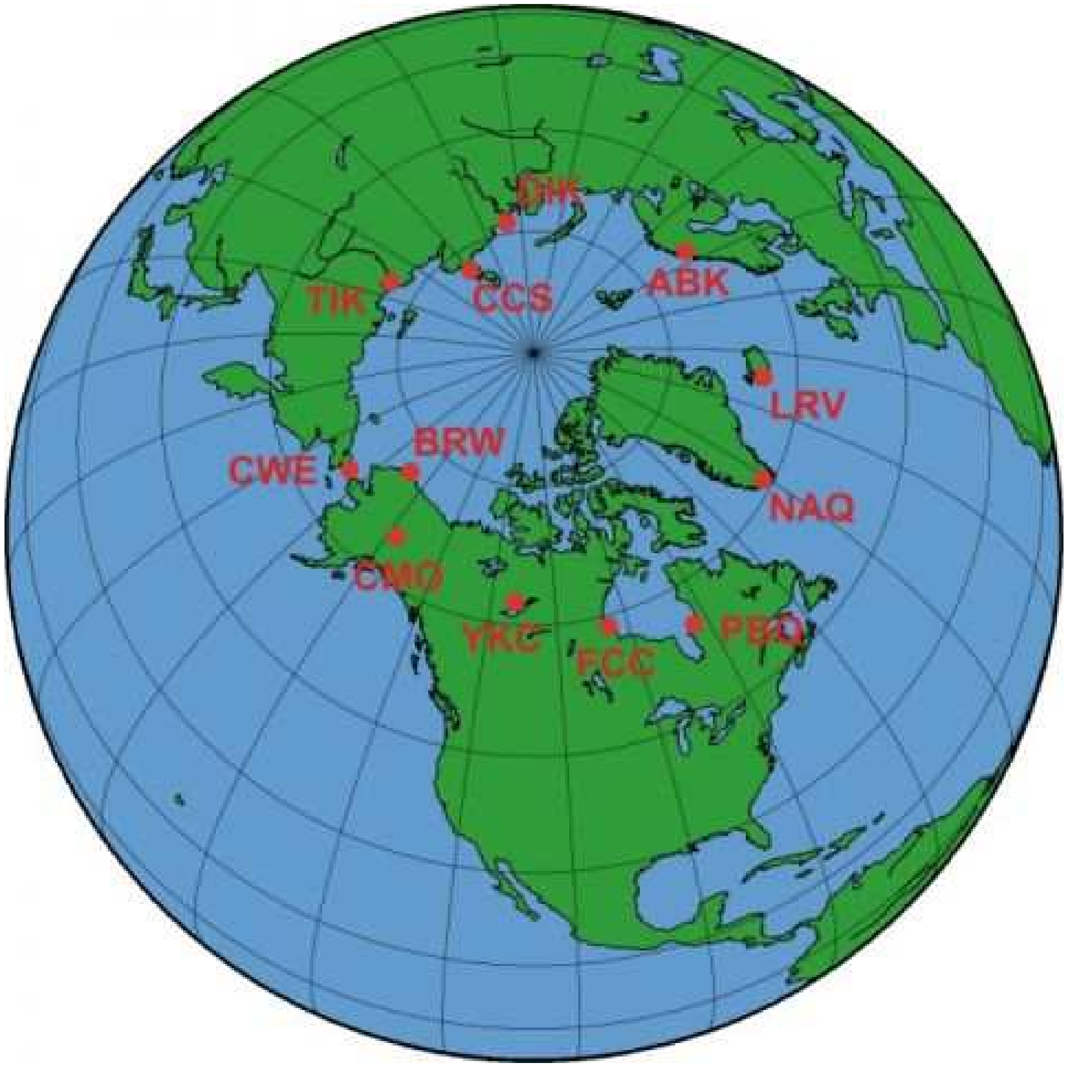
電漿球層頂內移，范愛倫輻射帶的高能粒子數目增多，環形電流強度增強，中低緯北向磁場分量減弱

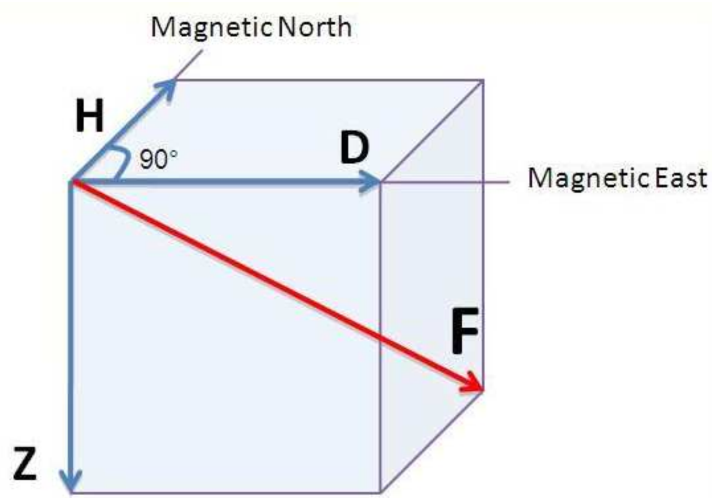
recovery phase:

磁層頂與電漿球層頂還原到安靜期的位置

AE (Auroral Electrojet) Index

The AE indices (AU, AL, AO, and AE) are derived from geomagnetic variations in the horizontal component during one-minute interval observed at selected observatories along the auroral zone in the northern hemisphere.





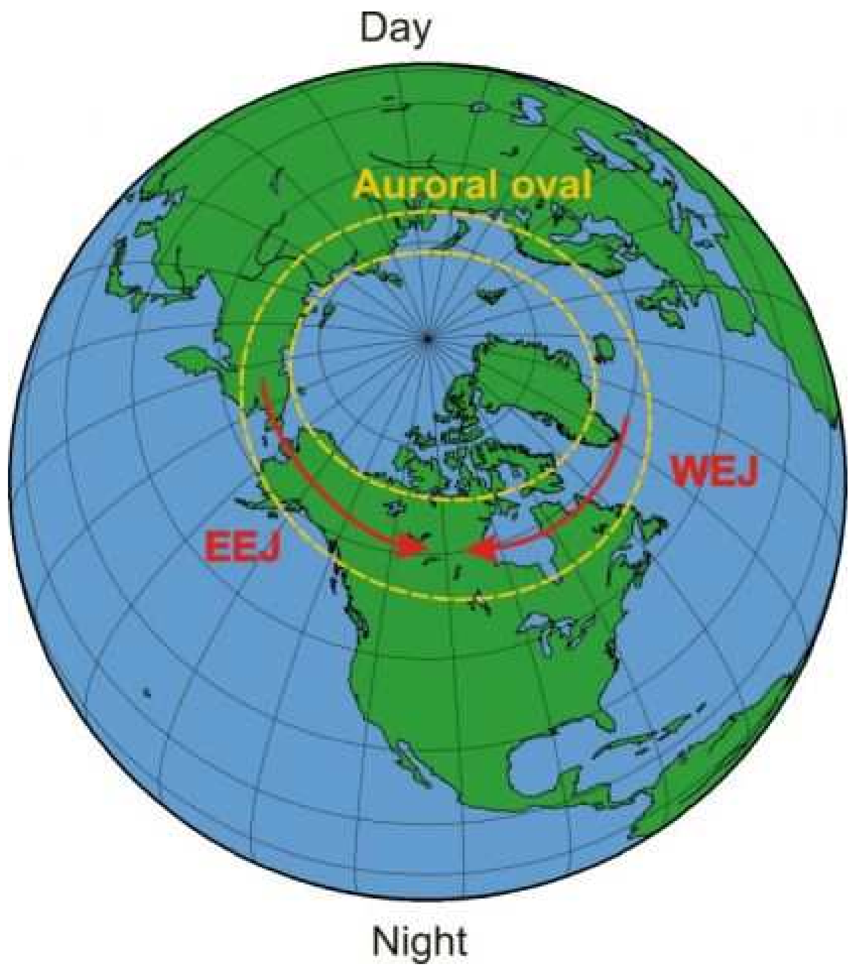
http://roma2.rm.ingv.it/en/themes/23/geomagnetic_indices/26/auroral_electroject_indices http://wdc.kugi.kyoto-u.ac.jp/aedir/ae2/AEObs.html

AE Index
(Auroral Electrojet)

AU (Auroral Upper) is the uppermost envelope of the superposed H-component perturbations at auroral latitudes

AL (Auroral Lower) is the lowest envelope of the superposed H-component perturbations at auroral latitudes

AO= (AU + AL)/2; AE= AU – AL



→AU is a measure of the eastward auroral electrojet (EEJ).

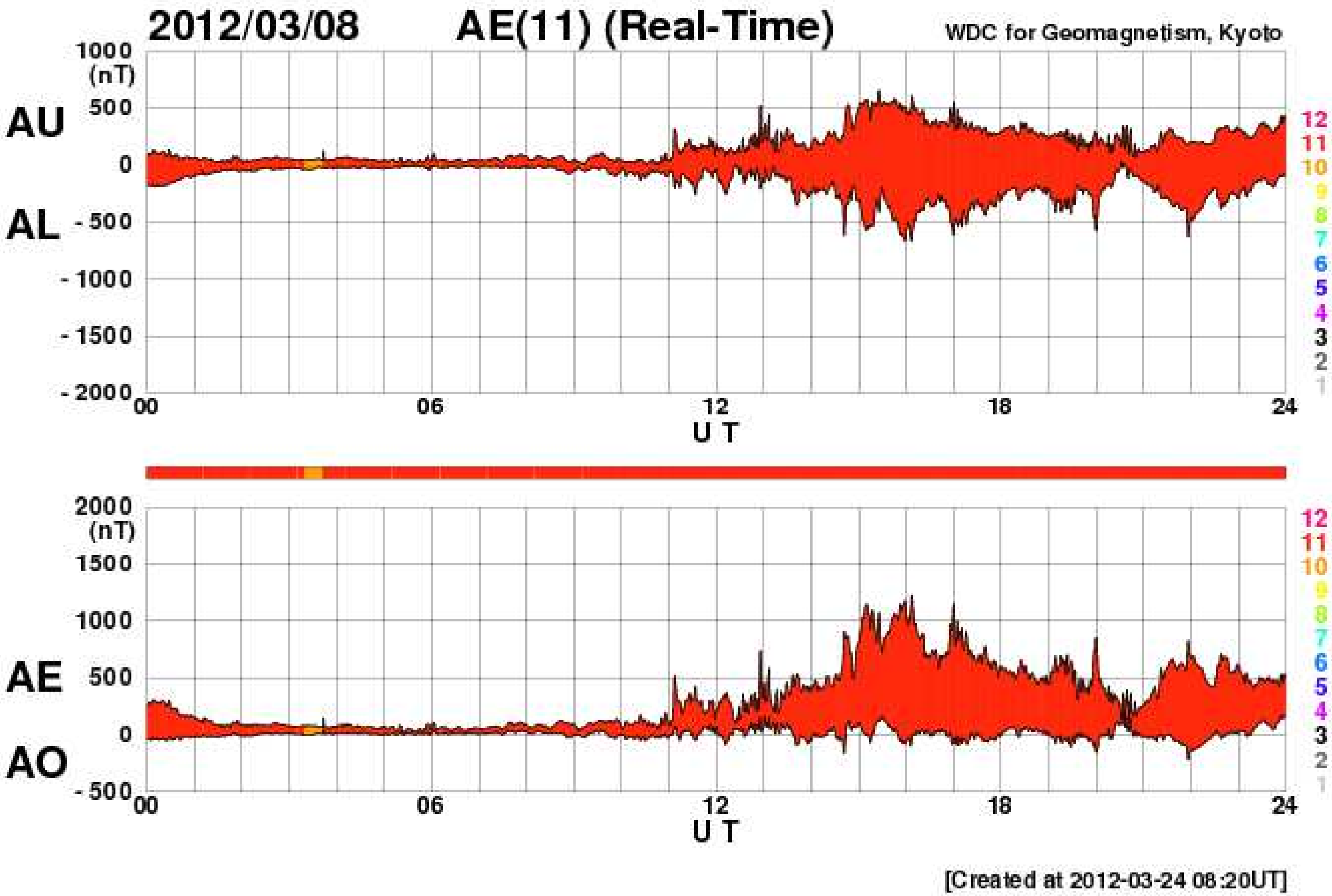
→AL is a measure of the westward auroral electroject (WEJ).

→AO is a measure of the equivalent zonal current.

→AE is the integrated effect of different current systems and not necessarily quantify specific physical processes occurring in the magnetosphere-ionosphere coupling system.

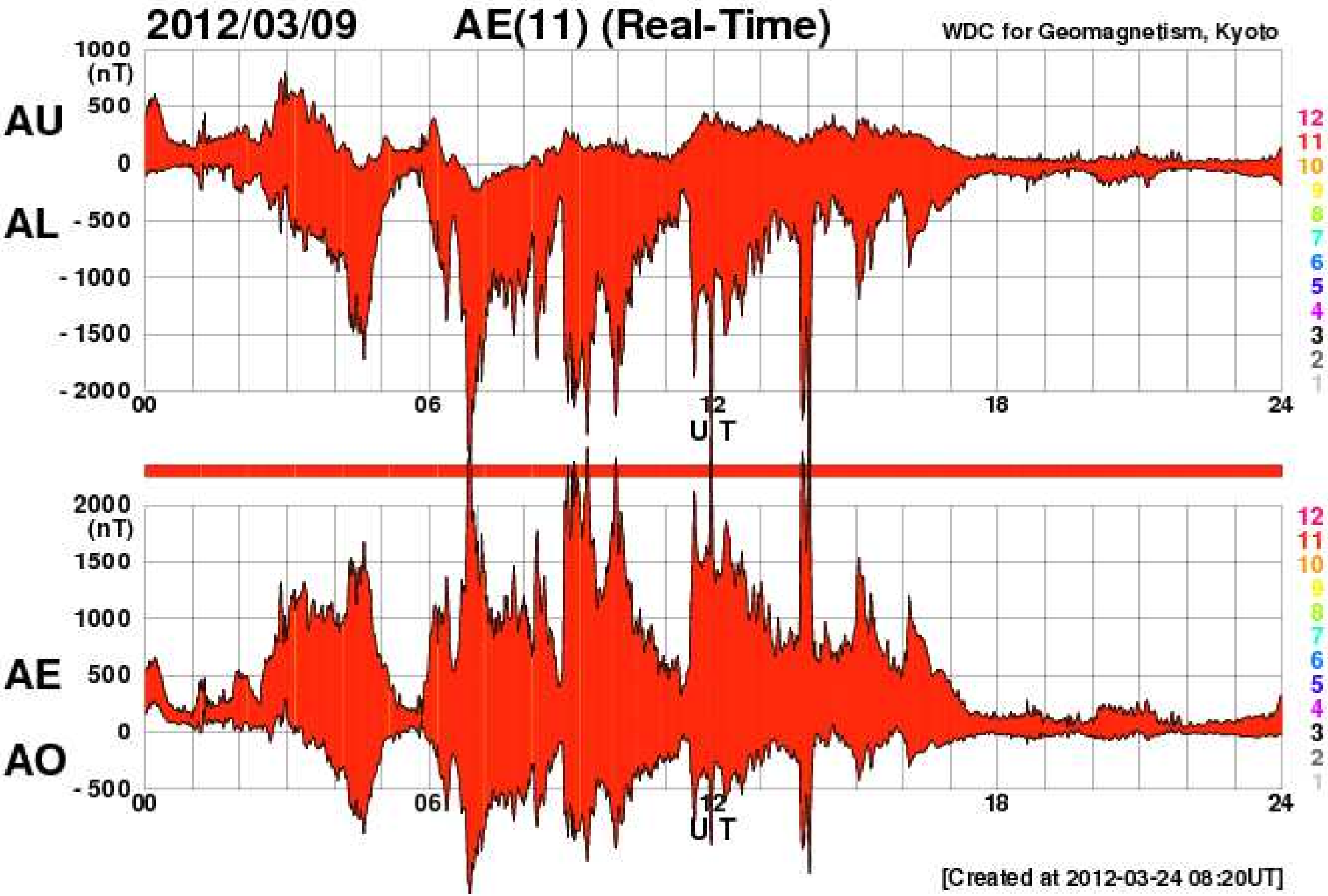
http://roma2.rm.ingv.it/en/themes/23/geomagnetic_indices/26/auroral_electroject_indices

AE (Auroral Electrojet) Index



http://wdc.kugi.kyoto-u.ac.jp/aedir/index.html

AE (Auroral Electrojet) Index



http://wdc.kugi.kyoto-u.ac.jp/aedir/index.html

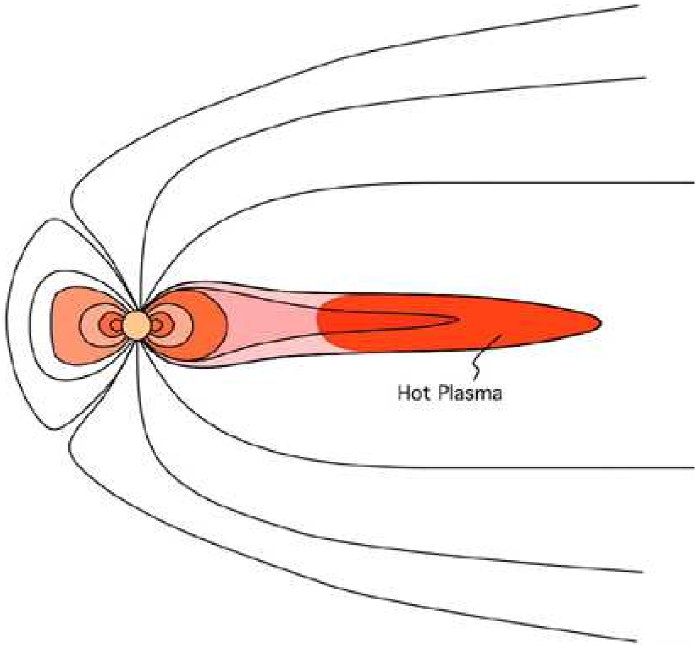
磁副暴(magnetic substorm)

→持續時間約3小時

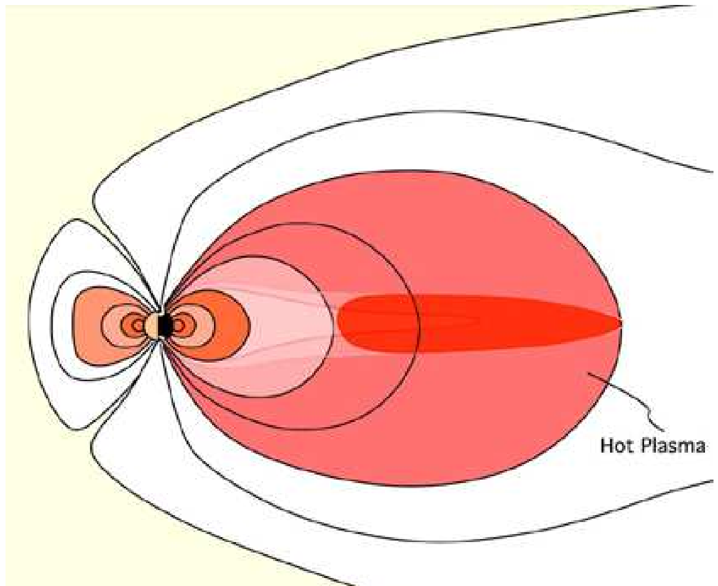
→影響地表高緯度區域

→過程:

grow phase:磁尾電漿片變薄，連原來接近磁偶極場區域的磁場也被拉長成磁尾的形狀，跨磁尾電流逐漸增強



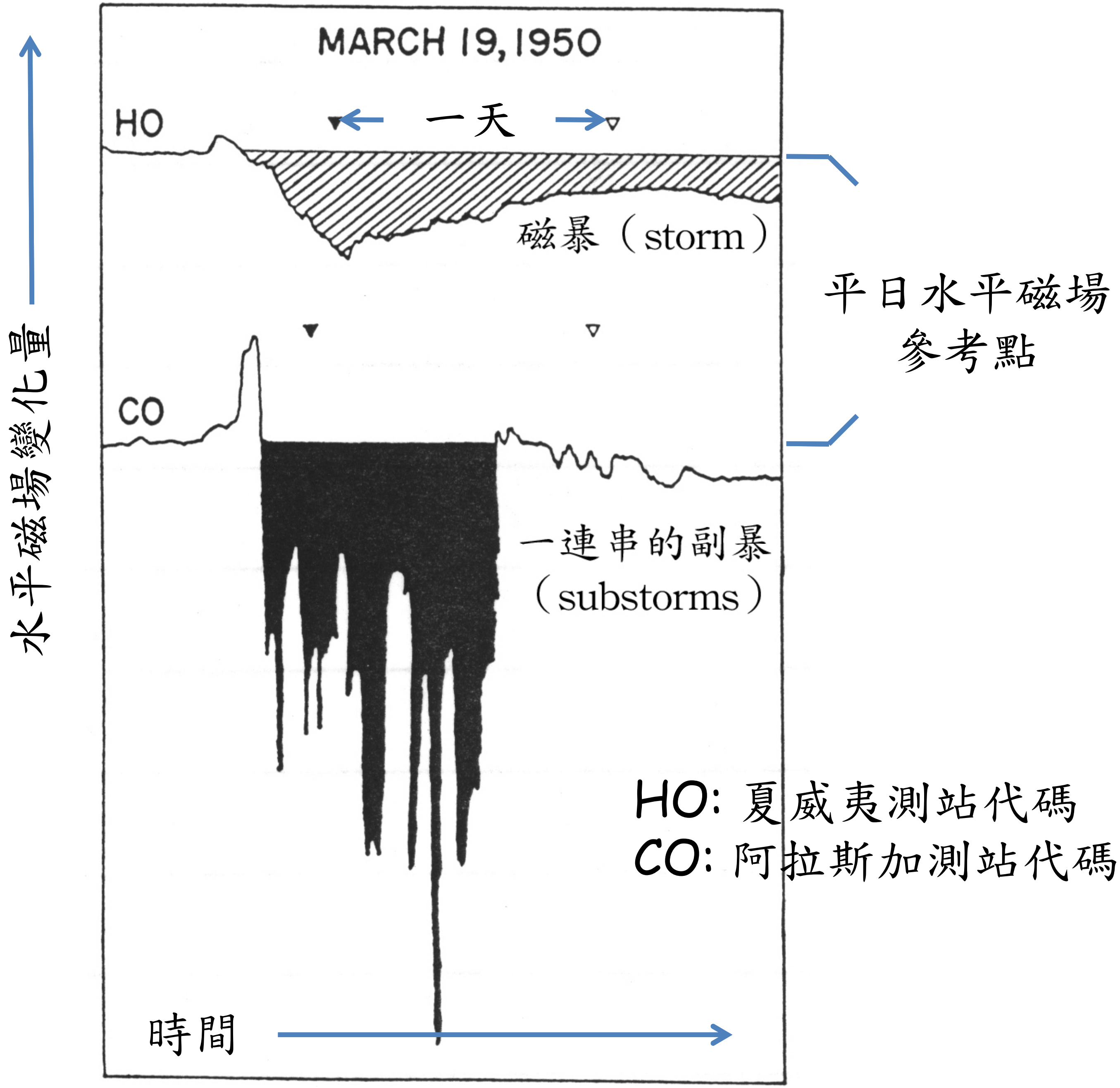
expansion phase:磁尾電漿片變厚，磁場變成比較像磁偶極場的結構。



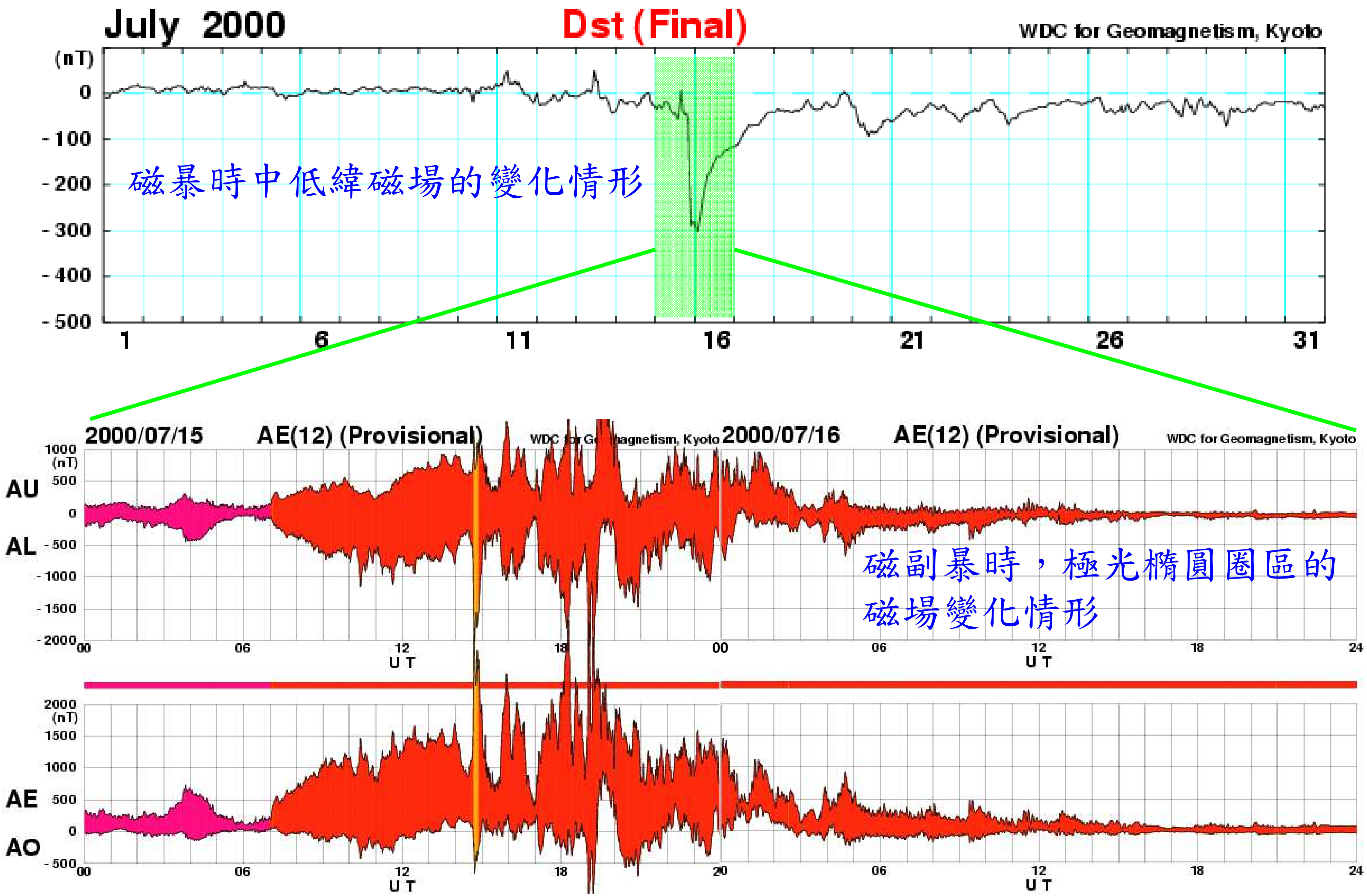
recovery phase:磁層還原為成長期以前的模樣

http://www.ss.ncu.edu.tw/~lyu/lecture_files/

磁暴與磁副暴



http://www.ss.ncu.edu.tw/~lyu/lecture_files/



http://wdc.kugi.kyoto-u.ac.jp/aedir/index.html

http://wdc.kugi.kyoto-u.ac.jp/dstdir/index.html