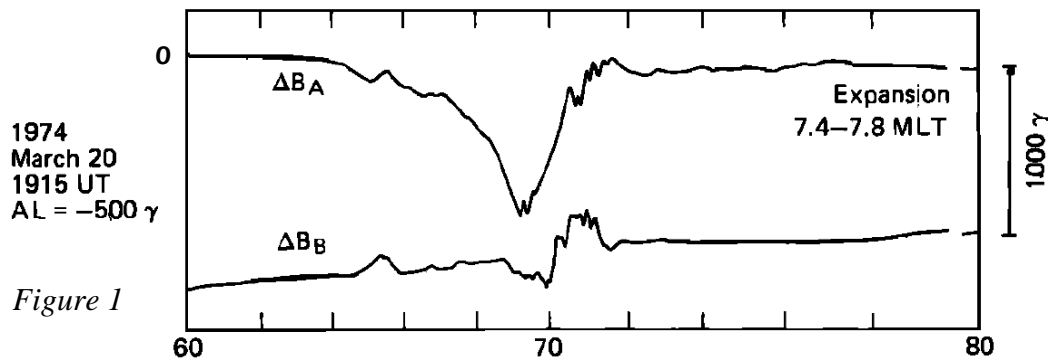# Mini-groupwork 5, 2014

Space Physics, EF2240

Figure 1 shows an example of the original magnetic field data from the Triad satellite, (which had a circular orbit with an altitude of 800 km), used to determine the statistical field-aligned current pattern in Figure 2.

Figure 1

The East-West magnetic field is denoted by ΔB_A, with positive values corresponding to an Eastward magnetic field. ΔB_A is given as a function of geomagnetic latitude. The magnetic local time of the measurements is also given, and can be assumed to be approximately constant during the pass of the auroral oval. The scale of the y-axis is defined by the length of the arrow to the right of the diagram, which is 1000 γ. (Note that $1\,\gamma = 10^{-9}$ T.)

Estimate the current densities in the two field-aligned current sheets between approximately 67° and 69°, and between 69° and 71°, and check if the direction of the currents for this pass of the auroral oval are the same as those expected from the statistical results in Figure 2.
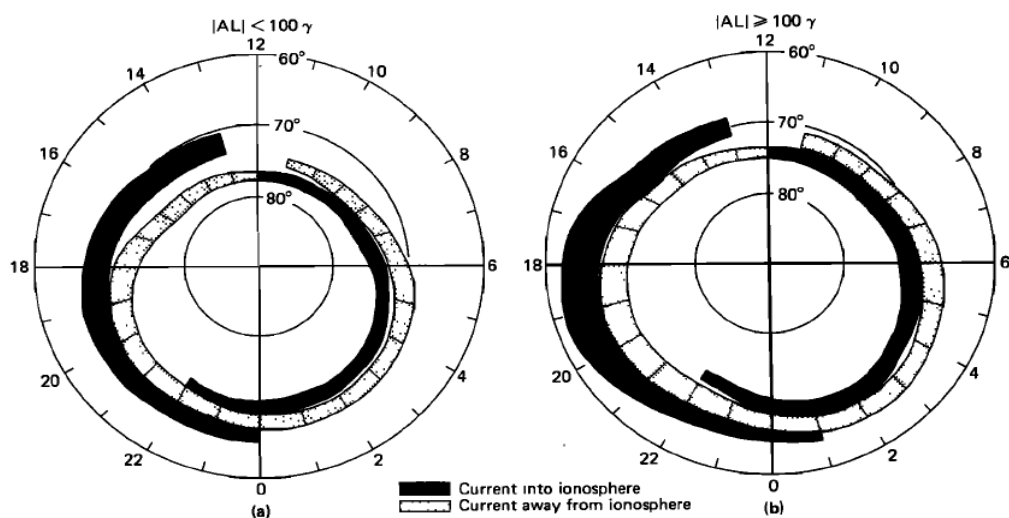

Figure 2   A summary of the distribution and flow directions of large-scale field-aligned currents determined from (*a*) data obtained from 439 passes of Triad during weakly disturbed conditions ($|AL| < 100\,\gamma$) and (*b*) data obtained from 366 Triad passes during active periods ($|AL| \geq 100\,\gamma$).