“If some countries have too much history, Canada has too much geography”

Prime Minister Mackenzie King, Speech to the House of Commons, Ottawa, June 18, 1936

Exploiting Our Advantages for Auroral Studies

Martin Connors, Athabasca University
Research Interests

- Quantitative interpretation of ground magnetic data (in conjunction with other inputs such as imaging)
- Use of Automated Forward Modelling to give parameters of auroral currents
- Ps 6 pulsations and vorticity/flow velocities, with possible generalization
- Substorm phenomenology – substorms are not even well described, never mind understood!
Recent Results

- Correlation of initiation of Ps 6 trains with substorm expansive phase onset
- Quantitative studies of motions and activity at poleward border
- Use of wavelet transform in determining propagation
- Development and installation of magnetometers
Science Theme

Ground magnetic research fits mainly into theme (2): the magnetospheric environment, starting with the bow shock and extending down to the upper ionosphere. 

*Basic phenomenology* is not well established and magnetic fields mainly reflect electric currents.
Tools

- dense networks with precision timing
- ‘morphology’ magnetometers – 1s often decimated to 1 min (fluxgates)
- ‘pulsation’ magnetometers (induction $dB/dt$)
- Communications (ease of data access; may have space weather implication)
History – we must build on what is already in place, instruments or communications infrastructure
Prospectus

• Package compelling capabilities at a low cost by use of existing facilities
• We DO NOT have enough magnetometers: huge gaps and lack of chains for conjunctions, inversion, timing of propagation
• Can be packaged as an NSERC SRO
• Time is an issue to some degree