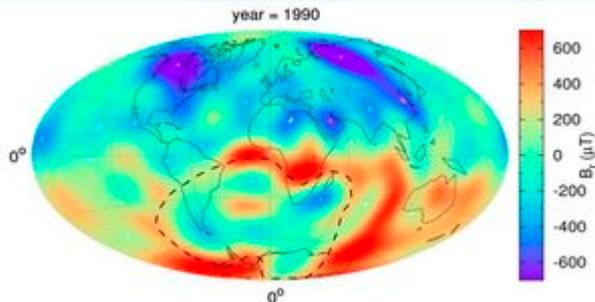


OR/16/030 Student and visitor activities

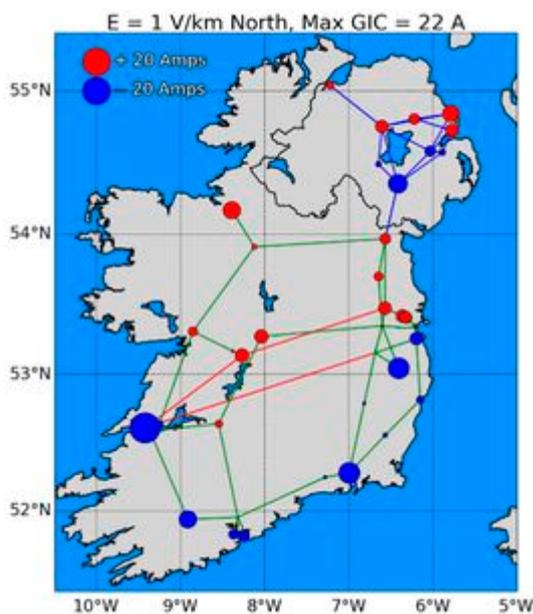
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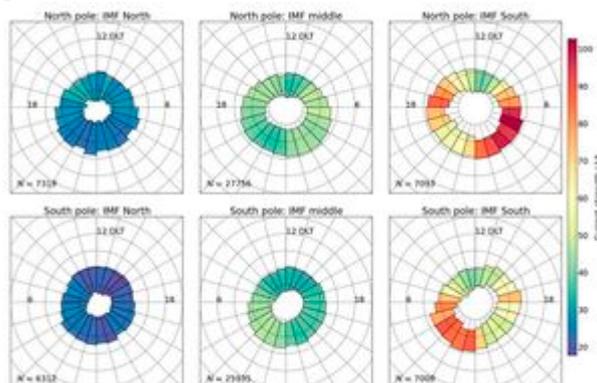
Thomson, Alan W P. 2016. Geomagnetism review 2015. *British Geological Survey Internal Report, OR/16/030*.



Evolution of the South Atlantic Anomaly (Maurits Metman).



Modelling the GIC resulting from a 1 V/km northward electric field within the Irish power network (Sean Blake).



Locations and intensities of the northern and southern auroral electrojets for different orientations of the interplanetary magnetic field as determined from Swarm

data. Coordinate system is dipole latitude/magnetic local time (Ashley Smith).

During 2015, BGS were involved with the supervision and hosting of several undergraduate projects together with the University of Edinburgh. Two PhD students started their geomagnetism projects and several academic visitors were hosted.

Postgraduate students

The BGS University Funding Initiative is currently supporting two PhD students in Geomagnetism, both of whom started in September 2015.

Ashley Smith at University of Edinburgh is looking into improving the separation of magnetic field sources using Swarm satellite data. In a preliminary study Ashley is detecting the locations and intensities of the auroral electrojets in data from Swarm and earlier satellite missions. The dependency of the variation of the electrojets on solar wind conditions, geomagnetic activity and secular variation of the main field will be investigated with the aim of elucidating the relative importance of these factors.

The other PhD student is **Maurits Metman**, at University of Leeds, who is studying the core geodynamo. He is looking at how magnetic diffusion controls secular variation, as opposed to control by advection of core fluid flow. He is also investigating the evolution of reversed magnetic flux patches, such as the South Atlantic Anomaly, and the control of core-mantle boundary heat flow on the behaviour of the magnetic field and the triggering of dipole reversals.

We currently advise two international PhD students:

Sean Blake is a 2nd year PhD student at Trinity College Dublin (TCD). He is supervised by Professor Peter Gallagher of TCD, though advised by staff at BGS on various aspects of Geomagnetically Induced Currents (GIC) and electric and magnetic field modelling.

Sean is researching the effects of GIC in the Irish power grid. He has also helped to set up a chain of variometers across Ireland to help with detailed measurement of the magnetic field variation during storms.

Rachel Bailey based at the ZAMG in Austria started in January 2015. She is researching the effects of GIC in the Austrian power grid, with BGS playing a consultancy role.

Undergraduate students

We had three research projects completed by fourth-year undergraduate students at the School of Geosciences, University of Edinburgh during 2015.

Nina Kahr looked at lunar tidal effects in the electric field data from Hartland observatory, identifying the peak periods of variation using Fourier analysis

Ben Cronin investigated a novel method for reducing the high-frequency noise in magnetometer datasets by jointly inverting the standard one-second data with hundred-hertz induction coil data.

Marcus Lancaster undertook a project to estimate the thickness of the ionosphere using Ionospheric Alfvén Resonances and radio frequency data from the Chiltern ionosonde.

Visitors

Benoit Heumez and **Xavier Lalanne** from the Institut de Physique du Globe de Paris (IPGP) visited us in December 2015. We exchanged information about current practices in observatory operations, data processing, real-time data transmission, and INTERMAGNET activities.

Professor Craig Rodger (University of Otago) and **Dr Mark Clilverd (BAS)** visited in December 2015 to discuss advanced preparations for a 3-year study, involving BGS staff, into GIC hazard in New Zealand.

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