Eric Donovan - Curriculum Vitae (Abbridged)

Present Position: Associate Professor, U. Calgary, Dept. of Physics and Astronomy

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Short History: NSERC PDF, Swedish Institute of Space Physics, Supervisor H. Opgenoorth, 1994-1995
Ph.D. (Physics), University of Alberta, Edmonton, Canada, 1993

Research Activity

The overall theme of Dr. Donovan's research is **energy and mass transport in the magnetosphere**, with recent focus on (1) terrestrial ion outflow and its role in magnetospheric dynamics, (2) the *instantaneous* global convection response to changes in the solar-wind driver, (3) processes that mitigate the brightness and latitude of the proton auroral distribution, (4) the ionospheric signature of rapid plasma flows in the CPS. The ion outflow work has involved the development of an empirical model of thermal and suprathermal ion outflow based on a ten year data set of measurements obtained by a Canadian instrument onboard the Akebono spacecraft, and the use of that model as input to a test-particle simulation of ion transport to the CPS. The main result is a characterization of ion fluence to the neutral sheet. The work was carried out primarily by Dr. Donovan's MSc student (C. Cully), and publications are listed below. The other three studies listed relied heavily on the use of ground-based optical and magnetic field observations. For example, Dr. Donovan is currently working with E. Spanswick (MSc student) on charcterizing the precipitation response to the substorm onset.

Dr. Donovan is the PI of NORSTAR, an array of digital ASIs in north-central Canada. At present, five NORSTAR imagers deliver a mesoscale mosaic of auroral emissions at roughly 20 second intervals. Plans are to expand this array to up to 10 imagers over the next five years. Dr. Donovan is leading the Canadian component of THEMIS - the first NASA constellation class mission. For THEMIS, the NORSTAR group will deploy, operate, and recover the data from 16 white light auroral imagers spread across Canada. Together with Drs. Trondsen, Murphree, and Cogger, he is developing a proposal for Ravens, a Canadian two-satellite auroral imaging mission. Together with Drs. J. Samson and I. Voronkov, he wrote the science plan for the second phase of the CANOPUS project. Currently, he is chair of the Canadian GeoSpace Monitoring (CGSM) Program Supervisory Group, Canadian liaison to the GEM Steering Committee, and Chair of the International Living With a Star Ground-based Task Group. Dr. Donovan has been the author or co-author of 40 refereed publications (with 3 more in review), 13 non-refereed publications, and has given 24 invited talks, colloquia, and seminars. Two of his students (Spanswick and Cully) have won AGU Outstanding Student Paper Awards.

Representative Publications (underline indicates members of current group).

Baker, G., E. Donovan, and B. Jackel, A comprehensive survey of auroral latitude Pc5 pulsation characteristics, *J. Geophys. Res.*, *in press*, 2003.

Donovan, E., B. Jackel, I. Voronkov, T. Sotirelis, F. Creutzberg, and N. Nicholson, Ground-based optical determination of the b2i boundary: a basis for an optical MT-index, *J. Geophys. Res.*, *108*(A3), 1115, doi:1029/ 2001JA009198, 2003.

Cully, C., E. Donovan, A. Yau, and H. Opgenoorth, Supply of ionospheric ions to the Central Plasma Sheet, *J. Geophys. Res.*, *108*(A2), doi:1029/ 2002JA009457, 2003.

Cully, C., E. Donovan, A. Yau, and G. Arkos, Akebono/Suprathermal Mass Spectrometer observations of low-energy ion outflow: dependence on magnetic activity and solar wind conditions, *J. Geophys. Res.*, *108*(A2) , doi:1029/ 2001JA009200, 2003.

Voronkov, I., E. Donovan, and J. Samson, Pseudo-breakup, breakup of a full substorm onset, and poleward border intensifications compared, *J. Geophys. Res.*, *108*(A2), 1073, doi:10.1029/2002JA009314, 2003.

Jayachandran, P., E. Donovan, J. MacDougall, J.-P. St.-Maurice, D. Moorcroft, and P. Prikryl, SuperDARN E-region backscatter boundary in the dusk-midnight sector - Tracer of equatorward boundary of the auroral oval, *Annales Geophysicae*, *20*:1-6, 2002.

Jackel, B. J., P. Eglitis, E. F. Donovan, A. T. Viljanin, D. D. Wallis, L. L. Cogger, and H. J. Opgenoorth, Observations of highly correlated near-simultaneous magnetic field perturbations at contraposed ground stations, *J. Geophys. Res.*, *106*(A11):25857-25872, 2001.

Knudsen D. J., Donovan, E. F., Cogger, L. L., B. J. Jackel, and W. D. Shaw, Width and structure of mesoscale optical auroral arcs, *Geophys. Res. Lett.*, 705, 2001.

Zesta, E., L. Lyons, and E. Donovan. The auroral signature of Eathward flow bursts observed in the magnetotail, *Geophys. Res. Lett.*, 3241, 2000.

Voronkov, I, E. F. Donovan, B. J. Jackel, and J. C. Samson Large-scale vortex dynamics in the evening and mid-night auroral zone: observations and simulations, *J. Geophys. Res.*, 105(A8), 18505-18518, 2000.

Skone, S. H., E. F. Donovan, and G. Rostoker, Characterizing the quiet time magnetic field at geostationary orbit, *J. of Geophys. Res.*, 100, 23583, 1995.

Donovan, E. F., Modeling the magnetic effects of field-aligned currents, *J. Geophys. Res.*, 98, 13539, 1993.