

SuperDARN



SuperDARN workshop 2015 31 May – 5 June, Leicester, UK



College
Court

College Court Conference Centre
Knighton Rd, Leicester LE2 3UF, UK



Radio and Space Plasma Physics
University of Leicester



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Sunday, 31 May

15:00 Registration opens

18:00 Ice-breaker

19:00 Evening buffet



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Monday, 1 June

Chair *Steve Milan*

09:00 Welcome and PI's report

Mark Lester

09:40 Initial observation with the SuperDARN Hokkaido Pair of (HOP) radars

Nozomu Nishitani, Tomoaki Hori, and SuperDARN HOP radars group*

10:00 An update on the Svalbard SuperDARN radar

D. Lorentzen and L.Baddeley*

10:20 Break

10:50 A new European mid-latitude high frequency SuperDARN radar

J. A. Wild, M. Lester, A. Grocott, S. Imber, A. Marchaudon, S. E. Milan, E. C. Thomas, and T. K. Yeoman*

11:10 AgileDARN: Overview and Development Schedule

Jingye Yan, Xia Cai, Ailan Lan, Jiaojiao Zhang, Chi Wang*

11:30 Reports from working groups

Operating Software working group report

J. M. Ruohoniemi

Data Analysis working group report

P. Ponomarenko

Scheduling working group report

G. Chisham

Spacecraft Working Group Report

K. Sterne, J. Wild, J. M. Ruohoniemi, R. Fear, T. Hori*

Data Distribution Working Group Report

K. Krieger, K. Sterne, M. Freeman, P. Breen*

12:30 Lunch



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Chair *Suzie Imber*

13:40 High-resolution vector velocity determinations from SuperDARN

W. A. Bristow

14:00 Techniques to improve the angle-of-arrival calculations at high-frequency radars

Angeline G. Burrell, Stephen E. Milan, Timothy K. Yeoman, and Mark Lester*

14:20 Using ray tracing to evaluate the performance of various methods for predicting the location of ionospheric scattering volumes and their refractive indices

R. A. Greenwald and N. A. Frissell*

14:40 Effects of electric field component representation on estimated cross polar cap potential - Implications for interhemispheric asymmetries

K. M. Laundal, M. Förster, S. Haaland, K. Snekvik, N. Østgaard, J. Reistad, P. Tenfjord, and S. Milan*

15:00 Break

15:30 Effect of ray and speed perturbations on ionospheric tomography by over-the-horizon radar: a new method, probably useful for SuperDarn too

Corinna Roy, Giovanni Occhipinti, Lapo Boschi, Jean-Philippe Moliné*

15:50 Calibration of historic interferometry data

P. Ponomarenko, N. Nishitani, A. Oinats, T. Tsuya, and J.-P. St.-Maurice*

16:10 Quantifying self-clutter in SuperDARN correlation functions

Ashton S. Reimer, Glenn C. Hussey*

16:30 A new algorithm for determining SuperDARN elevation angles

S. G. Shepherd

16:50 Ionospheric scattering observations using extended SuperDARN pulse sequences with multi-frequency Bayesian inference methods

J. Spaleta, J. Klein, W. Bristow*

18:00 Dinner (College Court)

20:00

19:00 Working group meetings

21:00



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Tuesday, 2 June

Chair *Tim Yeoman*

09:00 An Improved SuperDARN Data Fitting Algorithm Enabling Signal-Derived Error Bars
Ashton S. Reimer, Glenn C. Hussey*

09:20 Electric field mapping in the IGRF
A. D. M. Walker

09:40 Inferring vertical plasma motion with SuperDARN ?
S. Haaland

10:00 Solar cycle variations in the northern polar ionosphere
Angeline G. Burrell, Timothy K. Yeoman, Stephen E. Milan, and Mark Lester*

10:20 Break

10:50 Polar cap plasma density variations and their impact as scintillation sources
L. B. N. Clausen, J. I. Moen, Y. Jin, R. Chadwick*

11:10 Stagnation of a polar cap patch and decay of the accompanying plasma irregularities
K. Hosokawa, J. I. Moen, J.-P. St-Maurice, K. Shiokawa, and Y. Otsuka*

11:30 Long-term analysis of HF backscatter
H.A. Lawal, M. Lester, T.K. Yeoman and S. Imber*

11:50 A unified view of favorable gradients in the lower ionosphere
R. A. Makarevich

12:10 SuperDARN and GPS Observations of Traveling Ionospheric Disturbances
E. S. Miller, G. S. Bust, R. Nikoukar, S. G. Shepherd, J. M. Ruohoniemi*

12:30 Lunch

Chair *Maria-Theresia Walach*

13:40 TBD (invited)
R. A. Horne

14:20 Swarm and ESR observations of the ionospheric response to a field-aligned current system in the high-latitude midnight sector
F. Pitout, A. Marchaudon, P.-L. Blelly, X. Bai, F. Forme, S.C. Buchert, D.A. Lorentzen*

14:40 On monitoring HF propagation conditions at high latitudes
P. Ponomarenko and J.-P. St.-Maurice*



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- 15:00 *Break*
- 15:30 **Poster session**
- 18:00 *Dinner (College Court)*
- 20:00

Posters

- P1** **Experimental determination of the maximum range of the Buckland Park SuperDARN radar**
E. C. Bland, J. Whittington, K. Kamalakkannan, J. C. Devlin, A. J. McDonald, B. Bienvenu, and P. L. Dyson*
- P2** **Effects of the 20 March 2015 total solar eclipse on the ionosphere-thermosphere system**
M. Grandin, A. Marchaudon, A. Aikio, P.-L. Blelly, A. Kozlovsky, F. Pitout, T. Ulich, M. Lester, E. Miller, T. Yeoman*
- P3** **2-Parameter analysis software: A davitpy-based training tool for understanding how the time-dependent ionosphere impacts propagation and our measurements**
Raymond A. Greenwald and Nathaniel A. Frissell*
- P4** **Hemispheric asymmetry of the structure of dayside auroral oval and distribution of dayside auroral morphology**
Ze-Jun Hu, Yusuke Ebihara, Qiuju Yang, Hui-Gen Yang, Hong-Qiao Hu, Bei-Chen Zhang, Binbin Ni, Run Shi, and Trond S. Trondsen*
- P5** **The impact of solar wind co-rotating interaction regions on the dynamics of the neutral middle atmosphere**
A. J. Kavanagh
- P6** **SuperDARN Hokkaido East radar observation of a possible SC-triggered wave event including FLR signatures**
H. Kawano, A. S. Yukimatu, Y. Tanaka, S. Saita, N. Nishitani, and T. Hori*
- P7** **Observations of Auroral Region Ion Outflow during the VISIONS Sounding Rocket Campaign**
J. Klenzing, D. Rowland, R. Pfaff*
- P8** **Near noon sunward flows: Are they strongest summer time?**
A.V. Koustov, and Z. Aliaboozadeh*
- P9** **Interhemispheric comparison of seasonal mesospheric Tidal activity observed by mid-latitude SuperDARN Radars**
Garima Malhotra, J. Michael Ruohoniemi, Joseph B. H. Baker*



- P10 Cluster, Polar and SuperDARN simultaneous observations of cusp signatures in the northern and southern hemispheres**
A. Marchaudon, F. Pitout, K. J. Trattner, M. O. Chandler, S. Tair*
- P11 A preliminary study on the polar ionosphere features during periods of radial Interplanetary Magnetic Field**
M.F. Marcucci, E. Amata, G. Consolini, M. De Lauretis, P. De Michelis, P. Francia, S. Massetti, G. Pallochia, and M. Regi*
- P12 Coordinated observations of Pc5 pulsation events using SuperDARN and magnetometer data**
Z. Mtumela, J. A. E. Stephenson, and A. D. M. Walker*
- P13 Pc5 observations at King Salmon HF Radar during CT-TRIG mode period**
T. Nagatsuma
- P14 Derivation of ionospheric currents and Joule heating rate in the polar region from IMAGE/FUV and SuperDARN**
N. Ozaki, K. Hosokawa, and Y. Ogawa*
- P15 Geolocating HAARP-induced backscatter**
Timothy J. Palinski, Simon G. Shepherd, and William A. Bristow*
- P16 Large-scale observations of ULF pulsations in the subauroral region associated with a moderate substorm**
X. L. Shi, J. B. H. Baker, J. M. Ruohoniemi*, N. A. Frisell and E. G. Thomas*
- P17 Bayesian inference algorithm for SuperDARN rawACF fitting.**
J. Spaleta, J. Klein, W. Bristow*
- P18 Application of adaptive optics to scintillation correction in phased array high-frequency radar**
*T. E. Theurer and W. A. Bristow**
- P19 Are steady magnetospheric convection events prolonged substorms?**
M.-T. Walach, and S. E. Milan*



Wednesday, 3 June

Chair *Timothy David*

09:00 Superposed epoch analysis of midlatitude plasma density variations driven by geomagnetic storms

E. G. Thomas, J. B. H. Baker, J. M. Ruohoniemi, and A. J. Coster*

09:20 Study of ionospheric disturbances using the remote HF wave receiver of the SuperDARN Hokkaido East radar: initial results

Nozomu Nishitani, Ryusuke Kigawa, Yoshiyuki Hamaguchi, and Tomoaki Hori*

09:40 HF radar for long-range monitoring of ionospheric irregularities in the equatorial region

R. T. Parris, T. R. Pedersen, E. V. Dao*

10:00 Break

10:20 SuperDARN-NATION observations of mid-latitude storm-time ion-neutral coupling

P. P. Joshi, J. B. H. Baker, J. M. Ruohoniemi, J. J. Makela, D. J. Fisher, N. A. Frissell, and E. G. Thomas*

10:40 Dayside reconnection under IMF By dominated conditions: bending arcs, a reinterpretation

J. A. Carter, S. E. Milan, R. C. Fear, A. Kullen, and M. Hairston*

11:00 A test of ionospheric convection predictions from the expanding/contracting polar cap paradigm

M.-T. Walach, and S. E. Milan*

Workshop Excursion to Warwick Castle and Feast India

11:30 *Collect packed lunch*

12:00 *Coach departs College Court for Warwick Castle*

17:00 *Coach departs Warwick Castle for Feast India*

18:00 *Coach arrives Feast India*

21:30 *Coach departs Feast India for College Court*



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Thursday, 4 June

Chair *Angeline Burrell*

- 09:00 Interhemispheric differences of the high-latitude ionospheric convection patterns deduced from Cluster EDI observations over a full solar cycle**
M. Foerster and S. E. Haaland*
- 09:20 SuperDARN observations of ionospheric convection during a storm main phase**
Jianjun Liu, Hongqiao Hu, Qinghe Zhang, Desheng Han, Zejun Hu, Qiongqiong Liu*
- 09:40 IMF-By dependence of transient ionospheric flow perturbation associated with sudden impulses: SuperDARN observations**
T. Hori, A. Shinbori, S. Fujita, and N. Nishitani*
- 10:00 Characteristics of ionospheric convection associated with low-latitude aurora observed at Rikubetsu, Hokkaido during the 2015 March storm**
Nozomu Nishitani, Tomoaki Hori, Ryuho Kataoka, Yusuke Ebihara, and Kazuo Shiokawa*
- 10:20 Break**
- 10:50 Comparative space weather climatologies derived using the SuperDARN Map Potential algorithm.**
A. Grocott, J. A. Wild, G. Dorian, Y. Yamazaki, S. E. Milan*
- 11:10 Birkeland currents and the auroral electrojets: observations and modeling**
S. E. Milan, J. C. Coxon, J. A. Carter, M.-T. Walach, L. B. N. Clausen, H. Korth, and B. J. Anderson*
- 11:30 Mapping substorm-time convection using SuperDARN**
H. Laurens, A. Grocott*
- 11:50 Dynamics of polar cap plasma convection during periods of northward IMF**
J. Michael Ruohoniemi, M. Maimaiti, C. R. Clauer, Z. Xu, J. B. Baker, M. Nicolls, M. R. Hairston, and J.-P. St.-Maurice*
- 12:10 Characterizing the spatio-temporal response of high latitude convection**
R. A. Stoneback
- 12:30 Lunch**



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Chair *Jenny Carter*

- 13:40 The effect of different ionospheric electrodynamic patterns on the thermospheric state in a global model**
A. Ridley, S. Zou, N. Perlongo, L. Liuzzo, M. Liemohn, M. Conde, B. Bristow, and J. Makela*
- 14:00 Simultaneous ground-based optical and HF radar observations of the ionospheric footprint of open/closed field line boundaries along meridian line**
X. Chen, D. A. Lorentzen, J. Moen, K. Oksavik, L. J. Baddeley*
- 14:20 Direct observations of the full Dungey convection cycle in the polar ionosphere for southward interplanetary magnetic field conditions**
Q.-H. Zhang, M. Lockwood, J. C. Foster, S.-R. Zhang, B.-C. Zhang, I. W. McCrea, J. Moen, M. Lester, and J. Michael Ruohoniemi*
- 14:40 Maps of average ionospheric vorticity ordered by relationship with the open-closed magnetic field line boundary**
G. Chisham
- 15:00 Break**
- 15:30 EISCAT_3D: Next-generation incoherent scatter radar (invited)**
I.W. McCrea, on behalf of the EISCAT_3D Consortium
- 16:10 The interaction between transpolar arcs and cusp spots**
R. C. Fear, S. E. Milan, J. A. Carter, and R. Maggiolo*
- 16:30 Spatial and temporal structure of Pc5 ULF waves at high latitudes and in the polar cap**
E.C. Bland, A. J. McDonald, F. W. Menk and J. C. Devlin*
- 16:50 Measurements of HF Radar Propagation from Low-Drag Satellites Flying Below The F-Region Ionosphere**
Paul A. Bernhardt, Carl L. Siefring, and Paul Oppenheimer*

Workshop Dinner

- 18:00** *Coach departs College Court for Great Central Railway*
22:30 *Coach departs Great Central Railway for College Court*



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Friday, 5 June

Chair *Mark Lester*

- 09:00 The Charged Aerosol Release Experiment (Care II) for Investigation of Rocket Exhaust Interactions with the Ionosphere**
Paul A. Bernhardt, Carl L. Siefring, Stanley J. Briczinski, Robert H. Hozworth , Wayne Scales
- 09:20 First results from coordinated studies between SuperDARN and e-POP**
G.W. Perry, H. G. James, A. W. Yau, R. G. Gillies, and G.C. Hussey*
- 09:40 Growth signature of omega band auroras**
N. Sato, A. S Yukimatu, Y. Tanaka, T. Hori, A. Kadokura*
- 10:00 Ionospheric signatures of Kelvin-Helmholtz waves at Earth's dayside magnetopause**
E. G. Thomas, B. M. Walsh, K.-J. Hwang, J. B. H. Baker, J. M. Ruohoniemi, and J. W. Bonnell*
- 10:20 Break**
- 10:50 Outflow of heavy ions from the earth's upper atmosphere**
T.W. David, D.M. Wright, and S.E. Milan*
- 11:10 The ERG project: Current status and related scientific activities**
T. Hori, Y. Miyoshi, K. Seki, Y. Miyashita, K. Keika, M. Shoji, T. Segawa, I. Shinohara , Y. Tanaka, K. Shiokawa, K. Asamura, T. Takashima, N. Nishitani, A. S. Yukimatu, and T. Nagatsuma*
- 11:30 Working group reports and discussion**
- 12:30 Lunch and workshop ends**



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