Upper Atmosphere Physics

Title: Conjugate auroral observation in Iceland

Discipline: Upper Atmosphere Physics
Field leader: Natsuo SATO
Institution: National Insititute of Polar Research
Address: 1-9-10 Kaga, Ibabashi-ku, Tokyo 173-8515 JAPAN
TEL & E-mail: +81-3-3962-5874, nsato@nipr.ac.jp
Programme: Conjugate auroral observation in Iceland
Principal Investigator: Natsuo SATO
Proj. Period: 1992 - 2012
Institution: National Insititute of Polar Research
Co-research Institution & Scientist (out of JPN): Science Institute, University of Iceland: Thorsteinn Saemundsson

Planned field activity

Invest. Area: Husafell, Tjornes, Grimsstadir
Field Period: Sep. 2002
Logistics: Auroral TV camera at observatory
Description: [outline] Operate auroral TV camera at three observatories
Participants: N. Sato, H. Miyaoka, Y. Shinkai, K. Nakano

Field activity of previous year

Invest. Area: Husafell, Tjorness, Grimsstadir, Raufarhofn
Field Period: September
Logistics: Auroral TV camera
Description: Operate auroral TV camera at four observatories
Number of participants: 4

U-2

Title: Imaging Riometer Observations at Ny-Ålesund

Discipline: Upper Atmosphere Physics
Field leader: Masanori NISHINO
Institution: Solar-Terrestrial Environment Laboratory, Nagoya University
Address: 3-13 Honohara, Toyokawa 442-8507 JAPAN
TEL & E-mail: +81-533-89-5167, nishino@stelab.nagoya-u.ac.jp
Programme:
Principal Investigator:
Proj. Period:
Institution:
Co-research Institution & Scientist (out of JPN):

Planned field activity

Invest. Area: Ny-Ålesund (Svalbard)
Field Period: Continuous
Logistics: Observatory
Description: [outline] Study of solar wind-magnetosphere-ionosphere coupling by cosmic noise absorption measurements using the imaging riometer at Ny-Ålesund.
Participants:

Field activity of previous year

Invest. Area: Ny-Ålesund, Svalbard
Field Period:
Logistics:
Description: Imaging Riometer obsevations
Number of participants: 1

* See "Japanese Arctic Research Directory in 2001" P. 142

Title: Circum-pan Pacific Magnetometer Network Observation

Discipline: Upper Atmosphere Physics
Field leader: Kiyohumi YUMOTO
Institution: Space Environment Research Center, Kyushu University
Address: 6-10-1 Hakozaki, Fukuoka 812-8581 JAPAN
TEL & E-mail: +81-92-642-4403, yumoto@geo.kyushu-u.ac.jp
Programme: Solar wind energy transfer into magneto-ionos-atmosphere
Principal Investigator: Kiyohumi YUMOTO
Proj. Period: 2000 - 2002
Institution: Faculty of Sciences, kyushu niversity
Co-research Institution & Scientist (out of JPN): The Institute of Cosmophysical Research and Aeronomy, Russian Academy of Science (IKFIA): S. Solovyev

Planned field activity

Invest. Area: Yakutsk, Tixie, Chokurdakh, Kotel'nyy Is., Zyryanka, Zhigansk
Field Period: Apr. 2000 - Mar. 2003
Logistics: Magnetometer, All-Sky Camera
Description: [purpose] A purpose of this study is to understand a large-scale electromagnetic penetration and propagation process in the atmospheric transition region (the region from 80 to 5-600 Km in the height where neutral and charged particles are mixed in) from the polar to equatorial regions. By using the the Circum-pan-Pacific Magnetometer Network (CPMN) stations and the ISTP satellites, we clarifed the relationships between the temporal and spatial scales of disturbances in the solar wind and the large-scale electromagnetic disturbances that can penetrate even into the equatorial region on the ground. Especially, we can theoretically understand the electromagnetic coupling process between the polar and equatorial regions, including the solar wind, magnetosphere, ionosphere, atmosphere and conductive earth.
[outline] We are conducting the Circum-pan Pacific magnetometer Network (CPMN) observations and the FM/CW radar observations at Cebu in Philippines and Sasaguri in Japan, to understand a large-scale electromagnetic penetration and propagation process in the atmospheric transition region from the polar to equatorial regions.
Participants: K. Yumoto, H. Kawano, A. Yoshikawa, K. Hayashi, K. Shiokawa, M. Nishino, Z. Fujii, A. Morioka, S. Okano, M. Seto, Y. Kitamura, K. Nozaki, T. Kikuchi, T. Sakurai, Y. Tonegawa, K. Makita, K. Munakata, Y. Yamada

Field activity of previous year

Invest. Area: Kotel'nyy, Chokurdarkh, Tixie, Zyryanka, Magadan, Paratunka, Popov Island (Siberia)
Field Period: Apr. 2001 - Mar. 2002
Logistics:
Description: Continuous observation
Number of participants: 22

* See "Japanese Arctic Research Directory in 2001" P. 145

U-4

Title: Aurora emission

Discipline: Upper Atmosphere Physics
Field leader: Ryoichi FUJII
Institution: STEL, Nagoya University
Address: Furo-cho, Chikusa-ku, Nagoya 464-8601 JAPAN
TEL & E-mail: +81-52-789-4309, rfujii@stelab.nagoya-u.ac.jp
Programme: Derivation of the energy spectrum of precipitating electrons using multi-wavelengths photometer
Principal Investigator: Ryoichi FUJII
Proj. Period: 2001 - 2005
Institution: Nagoya University
Co-research Institution & Scientist (out of JPN): University of Tromsoe: Chris Hall

Planned field activity

Invest. Area: Tromsø
Field Period: Oct. 2002 - Mar. 2003
Logistics: Photometer
Description: [purpose] Derivation of the energy spectrum of precipitating electrons using multi-wavelengths photometer
[outline] Measurement of intensity of aurora emissions with the multi-wavelengths photometer controled automatically with a PC
Participants: Ryoichi Fujii, Satonori Nozawa, Kazuhiro Adachi

Field activity of previous year

Invest. Area: Tromsø
Field Period: Oct. 2001 - Mar. 2002
Logistics: Photometer
Description: Measurement of intensity of aurora emissions with the multi-wavelengths photometer controled automatically with a PC
Number of participants: 6

Title: Observations of large-scale waves in the polar middle atmosphere and lower thermosphere by the EISCAT radar and collaborative radar and optical platforms

Discipline: Upper Atmosphere Physics
Field leader: Takehiko ASO
Institution: Arctic Environment Research Center, National Institute of Polar Research
Address: 1-9-10 Kaga, Ibabashi-ku, Tokyo 173-8515 JAPAN
TEL & E-mail: +81-3-3962-4756, aso@nipr.ac.jp
Programme: Grant-in-aid for Scientific Research
Principal Investigator: Takehiko ASO
Proj. Period: 1999 - 2002
Institution: Arctic Environment Research Center, National Institute of Polar Research
Co-research Institution & Scientist (out of JPN): Univ. Tromso: Chris Hall, Max Planck Institute for Aeronomy: Juergen Roettger

Planned field activity

Invest. Area: Svalbard, Tromsø
Field Period:
Logistics:
Description: [purpose] To study the physics of global atmospheric waves in the polar middle and upper atmosphere
[outline] To observe large-scale atmospheric waves in the polar middle atmosphere and lower thermosphere by the close collaboration of EISCAT radar and global radar and optical network
Participants: T. Aso (NIPR), M. Tsutsumi (NIPR)

Field activity of previous year

Invest. Area: Svalbard, Tromsø (Norway)
Field Period: Oct. 2001
Logistics:
Description: EISCAT radar, SOUSY radar
Number of participants: 2

* See "Japanese Arctic Research Directory in 2001" P. 141

U-6

Title: ALIS (Auroral Large Imaging System) aurora/airglow conjunction observation with EISCAT radar and/or satellites

Discipline: Upper Atmosphere Physics
Field leader: Takehiko ASO
Institution: Arctic Environment Research Center, National Institute of Polar Research
Address: 1-9-10 Kaga, Ibabashi-ku, Tokyo 173-8515 JAPAN
TEL & E-mail: +81-3-3962-4756, aso@nipr.ac.jp
Programme: Grant-in-aid for Scientific Research
Principal Investigator: Takehiko ASO
Proj. Period: 1995 - 2004
Institution: Arctic Environment Research Center, National Institute of Polar Research
Co-research Institution & Scientist (out of JPN): Urban Braendstroem

Planned field activity

Invest. Area: Kiruna (Sweden)
Field Period: Oct. 2002 - Mar. 2003
Logistics: ALIS (Auroral Large Imaging System) EISCAT
Description: [outline] ALIS (Auroral Large Imaging System) multi-station observations of aurora and airglow to determine their heights and luminous structures by tomographic inversion and triangulation. Conjunctive experiments with EISCAT radar/heating. are now intensively pursued.
Participants: T. Aso (NIPR), M. Ejiri (NIPR), Björn Gustavsson (NIPR), Urban Brändstroem (IRF)

Field activity of previous year

Invest. Area: Kiruna (Sweden)
Field Period: Mar. 2002
Logistics: ALIS (Kiruna) and EISCAT radar
Description: ALIS multi-station observations of aurora and airglow
Number of participants: 1

* See "Japanese Arctic Research Directory in 2001" P. 137

Title: Observation of atmospheric dynamics in the polar mesosphere and lower thermosphere by the NSMR - NIPR - Nippon/Norway Svalbard Meteor Radar

Discipline: Upper Atmosphere Physics
Field leader: Takehiko ASO
Institution: Arctic Environment Research Center, National Institute of Polar Research
Address: 1-9-10 Kaga, Ibabashi-ku, Tokyo 173-8515 JAPAN
TEL & E-mail: +81-3-3962-4756, aso@nipr.ac.jp
Programme: Grant-in-aid for Scientific Research
Principal Investigator: Takehiko ASO
Proj. Period: 1999 - 2004
Institution: Arctic Environment Research Center, National Institute of Polar Research
Co-research Institution & Scientist (out of JPN): Univ Tromso: Chris Hall

Planned field activity

Invest. Area: Svalbard
Field Period: Apr. 2002 - Mar. 2003
Logistics: Meteor radar
Description: [purpose] To study the wave dynamics of polar nesosphere and lower thermosphere
[outline] The system can detect drifting meteor trails and, using radar interferometry, infer information as to the structure and dynamics of the polar cap mesosphere and lower thermosphere, viz., neutral wind and temperature field. A continuous operation will give a temporal coverage unprecedented at this latitude
Participants: T. Aso (NIPR), M. Tsutsumi (NIPR), Chris Hall (UiT)

Field activity of previous year

Invest. Area: Svalbard
Field Period: Mar. 2001 - continuous
Logistics: NSMR (meteor radar)
Description:
Number of participants: 3

* See "Japanese Arctic Research Directory in 2001" P. 147

U-8

Title: Auroral spectrograph

Discipline: Upper Atmosphere Physics
Field leader: Takehiko ASO
Institution: Arctic Environment Research Center, National Institute of Polar Research
Address: 1-9-10 Kaga, Ibabashi-ku, Tokyo 173-8515 JAPAN
TEL & E-mail: +81-3-3962-4756, aso@nipr.ac.jp
Programme: Grant-in-aid for Scientific Research
Principal Investigator: Takehiko ASO
Proj. Period: 1999 - 2004
Institution: Arctic Environment Research Center, National Institute of Polar Research
Co-research Institution & Scientist (out of JPN): UNIS/Univ Tromsoe: F. Sigernes

Planned field activity

Invest. Area: Svalbard
Field Period: Apr. 2002 - Mar. 2003
Logistics: Auroral spectrograph
Description: [outline] An aurora spectrograph in Longyearbyen studies how the auroral and airglow spectrum changes both spatially and temporally with respect to changes in the upper atmospheric environment. It consists of a large fish-eye lens (180-degree FOV, f=6mm, F1.4), a slit which passes the light from the sky along meridian direction, a collimating optics, a grism with 600gr/mm, an imaging optics, and a digital camera with a bare, back-illuminated CCD chip of 512 x 512 pixels. The spectrograph covers a wavelength of 420-740nm with spectral bandwidth of 0.6nm, and with spatial resolution of 0.18 x 0.18 degrees. The sensitivity is 0.06cts/pixel/Rayleigh/sec which enables sampling rate of a few seconds per image. This also contributes to the collaborative study with the EISCAT Svalvard Radar (ESR) and other ground-based observations.
Participants: T. Aso (NIPR), S. Okano (Tohoku U.), M. Taguchi (NIPR), M. Tsutsumi (NIPR), T. Sakanoi (Tohoku U.)

Field activity of previous year

Invest. Area: Svalbard
Field Period: Winter period
Logistics: Auroral spectrograph
Description: Aurora and airglow in winter time
Number of participants: 2

* See "Japanese Arctic Research Directory in 2001" P. 144

Title: Measurement of wind in the polar mesosphere

Discipline: Upper Atmosphere Physics
Field leader: Satonori NOZAWA
Institution: STEL, Nagoya University
Address: Furo-cho, Chikusa-ku, Nagoya 464-8601 JAPAN
TEL & E-mail: +81-52-789-4303, nozawa@stelab.nagoya-u.ac.jp
Programme: Coupling of meosphsere-lower thermosphere in the polar region
Principal Investigator: Satonori NOZAWA
Proj. Period: 1998 - 2010
Institution: Nagoya University
Co-research Institution & Scientist (out of JPN): University of Tromsoe: Chris Hall

Planned field activity

Invest. Area: Tromose
Field Period: 24 hours/day
Logistics: MF radar
Description: [purpose] Coupling of mesosphere and lower thermosphere in the polar region
[outline] Wind velocity between 70 and 91 km at 3 km step every 5 minutes
Participants: Satonori Nozawa, Ryoichi Fujii, Chris Hall, Asgeir Brekke, Alan Manson, Chris Meek

Field activity of previous year

Invest. Area: Tromsoe
Field Period: 24 hours/day
Logistics: MF radar
Description: Wind velocity between 70 and 91 km at 3 km step every 5 minutes
Number of participants: 6

* See "Japanese Arctic Research Directory in 2001" P. 143

U-10

Title: Data collection base on STEP Polar Network for manetic field variations

Discipline: Upper Atmosphere Physics
Field leader: Kanji HAYASHI
Institution: Department of Earth and Planetary Science, Graduate School of Sciece, The University of Tokyo
Address: 7-1-3 Hongou, Bunkyo, Tokyo 113-0033 JAPAN
TEL & E-mail: +81-3-5841-4587, hayashi@eps.s.u-tokyo.ac.jp
Programme: Continuous data collection of ULF magnetic field at HAARP experiment site
Principal Investigator: Kanji HAYASHI
Proj. Period:
Institution: Department of Earth and Planetary Science, Graduate School of Sciece, The University of Tokyo
Co-research Institution & Scientist (out of JPN): Geophysical Insititute, Univeristy of Alaska: John Olson

Planned field activity

Invest. Area: Gakona (Alaska)
Field Period:
Logistics: Search coil magnetometer, Internet link
Description: [purpose] Continuous data collection of ULF magnetic field at HAARP experiment site and real time monitoring of spectral data in the local web page
Participants: Kanji Hayashi, staffs on site

Field activity of previous year

Invest. Area:
Field Period:
Logistics:
Description:
Number of participants: