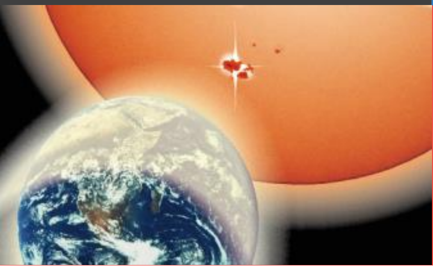
Variability of the Sun and Its Terrestrial Impact (VarSITI)
SEE / ISEST-Minimax24 / SPeCIMEN / ROSMIC
http://www.varsiti.org/

Vol. 16, January 2018



VarSITI Newsletter

Inside this issue

Project ISEST / SPeCIMEN / ROSMIC

Article 1:

A new database of radiation doses at commercial flight altitudes due to solar particle storms is linked to GLE database

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Solar flares and coronal mass ejections are powerful sporadic events taking place on the Sun, but the physics behind is still not fully understood. Such events can cause, in particular, solar particle storms characterized by very strong fluxes of highly energetic particles (mostly protons) in the vicinity of

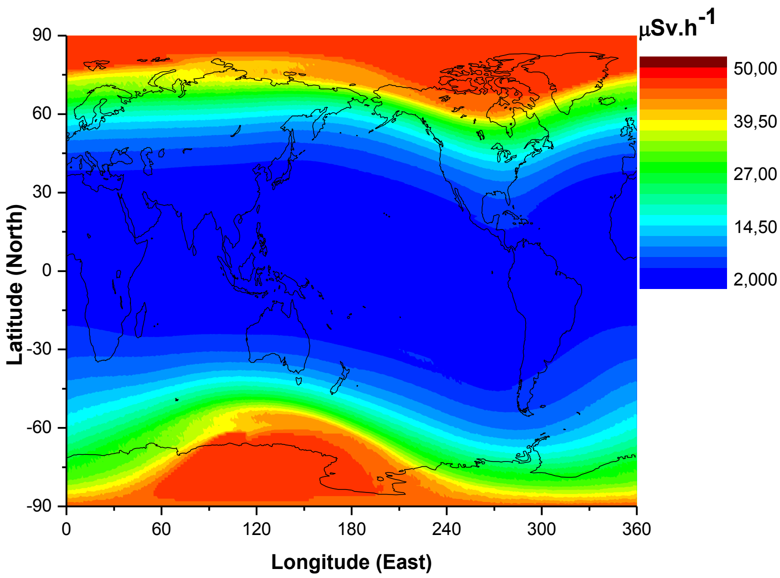

Figure 1. Map of effective dose rate at altitude of 35 kft above sea level during the main phase of GLE 70 on 13 December 2006.

Earth. These particles form an important driver of space weather and pose significant hazards for the modern society, especially for space-borne technologies, e.g. navigation, communication, etc., and also can put astronauts to danger [1, 2].

The humanity is normally well protected from those particles by the thick atmosphere of the Earth. However, during extreme solar events, energetic particles may occasionally possess sufficient energy and fluxes to produce notable effects in the atmosphere, particularly in (sub)polar regions, where trans-polar commercial flights are operated. A special class of such events that can produce a measurable effect is ground level enhancements (GLEs). At present, 72 GLE events have been registered by the worldwide neutron monitor network. If a trans-polar flight takes place during a strong GLE event, passengers and the aircrew may receive a radiation exposure exceeding the background level due to galactic cosmic rays. A map of the radiation dose for GLE No. 70 (13-Dec-2006) is shown in Figure 1, showing that the dose can be greatly enhanced around the geomagnetic poles. Nowadays, the exposure to radiation of the flying personnel due to cosmic radiation of galactic and/or solar origin is considered as occupational (International Commission on Radiological Protection, 1991) [3]. Therefore it needs to be monitored. While monitoring the background radiation is routine nowadays, including a variety of commercial packages, assessment of radiation doses during solar particle storms is more difficult because of their short duration and significant variability.

A database which provides basic information, mostly verified count rates of the neutron monitors around the globe, about GLE was developed by the research community (Louis Gentile, Margaret (Peggy) Shea and Don Smart, Marc Duldig were hosting it over the years) and is presently hosted by the University of Oulu at the URL: http://gle.oulu.fi. Recently, thanks to the focused support from VarSITI/SCOSTEP it has been greatly improved by providing, for each GLE event, where possible, information on the energy/rigidity spectra of solar energetic particles and the corresponding computed radiation doses at the polar flight altitude of 35 kft or ~11 km. The new database can be accessed as http://gle.oulu.fi/#/dose. Screenshots of the new database are shown in Figures 2 and 3. The computations of the radiation dose were performed using a new numerical model for computation of effective and/or ambient dose equivalent at aviation altitudes [4], developed by the team.

GLE database

Display ○ GLE data, ○ availability grid ◉ or Effective dose rate

Select a GLE: #70 – 2006-12-13

GLE: 70 at 2006-12-13

Modulation potential **467** MV. Altitude **35** kft. GCR contribution **7.36** μSv h^{-1}.

Effective dose rate, series # 1

Interval start [UTC]	Interval end [UTC]	Effective dose rate [μSv h^{-1}]
2006-12-13 02:58:00	N/A	40.34
2006-12-13 03:38:00	N/A	19.58
2006-12-13 04:38:00	N/A	13.65
2006-12-13 06:38:00	N/A	9.41

Effective dose rate, series # 2

Interval start [UTC]	Interval end [UTC]	Effective dose rate [μSv h^{-1}]
2006-12-13 02:57:00	N/A	21.84
2006-12-13 03:20:00	N/A	67.3
2006-12-13 04:00:00	N/A	78.16

Effective dose rate, series # 3

Interval start [UTC]	Interval end [UTC]	Effective dose rate [μSv h^{-1}]
2006-12-13 03:00:00	N/A	17.55
2006-12-13 04:30:00	N/A	21.98
2006-12-13 05:30:00	N/A	4.43

Figure 2. Screenshot of the database, showing the information of effective dose rate at 35 kft altitude above sea level for GLE 70, for three different estimates of the solar energetic particle spectrum (see continuation in Figure 3).

The new database allows one to assess the radiation effects at a cruise flight altitude during GLE events over the last decades. The database will be kept updated when new events occur and/or new information is retrieved.

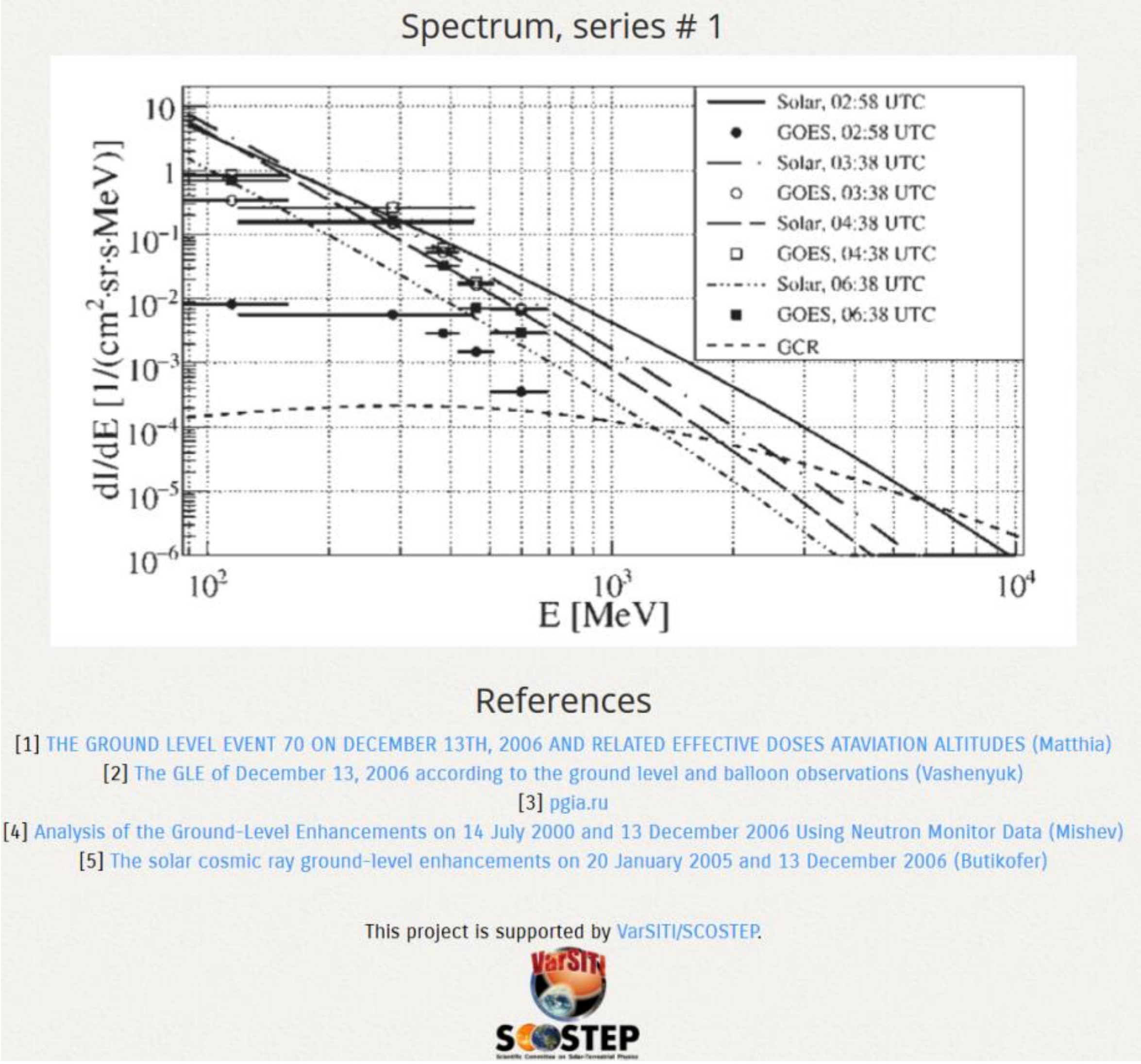

Figure 3. Screenshot of the new database, showing the information of energy/rigidity spectra and corresponding bibliographic source, for the GLE 70 (continued from Figure 2).

Acknowledgements:

This work was supported by the VarSITI/SCOSTEP grant and partially by the Academy of Finland (project 272157, Center of Excellence ReSoLVE).

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Project ISEST

Article 2:

ISEST Working Group 5: Bs Challenge

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Intervals of strong southward magnetic fields (hereafter Bs) within interplanetary Coronal Mass Ejections (ICMEs) represent the most decisive parameter for their geoeffectiveness. Therefore, we need to devise methods capable of predicting the CME magnetic field upon impact on Earth well before their arrival at 1 AU. The challenge is that radio observations supplying direct diagnostics of CME magnetic fields are rare (e.g., Bastian et al. 2001; Tun & Vourlidas 2013; Carley et al. 2017), and CMEs experience various modulations (e.g., rotations, deflections, deformations etc) during their transit to Earth. ISEST WG5[1] aims to reconstruct the near-Sun magnetic configuration of CMEs from observations and models and to eventually predict their Bs upon arrival at 1 AU.

Various methods of near-Sun CME magnetic field inference have recently emerged (Kunkel & Chen 2010; Savani et al. 2015,2017; Isavnin 2016; Gopalswamy et al. 2017; Kay et al. 2017; Kay & Gopalswamy 2017; Möstl et al. 2017). They are based on various physical principles and concepts to derive a near-Sun CME magnetic field and to then extend it to 1 AU (e.g., Lorentz self-forces, magnetic force balance, reconnected magnetic flux in post-eruption arcades, magnetic flux conservation). They depend on constraints that could be retrieved on a regular basis from STEREO, SOHO and SDO observations. Outward propagation of inner coronal loops (Jackson et al. 2015) and pattern recognition (Riley et al. 2017) are also used in Bs predictions.

We present results from one of these methods called H-CME developed within WG5 (Patsourakos et al. 2016; Patsourakos & Georgoulis 2016,2017). H-CME uses theoretical formulations of the magnetic field of flux-rope CMEs in terms of their magnetic helicity (Hm) and geometrical characteristics like their length and radius (Dasso et al. 2006). Hm calculations use photospheric magnetic field observations of CME source regions (e.g., Valori et al. 2016) while CME geometrical parameters are deduced from multi-viewpoint coronagraphic CME observations (Thernisien et al. 2009). Invoking the Hm-conservation principle (Berger 1984) yields the near-Sun CME magnetic field magnitude and this is extrapolated to 1 AU using a power-law of the radial distance with an exponent α_B. For the classical Lundquist (1950) model, H-CME with an α_B around -1.6 reproduces the bulk of ICME observations at 1 AU (Figure 1). Extension of H-CME to other models (non-linear force-free, non-force-free, spheromak etc) shows that all considered models could fairly well reproduce the ICME observations at 1 AU provided a suitable α_B-range is used (Figure 2).

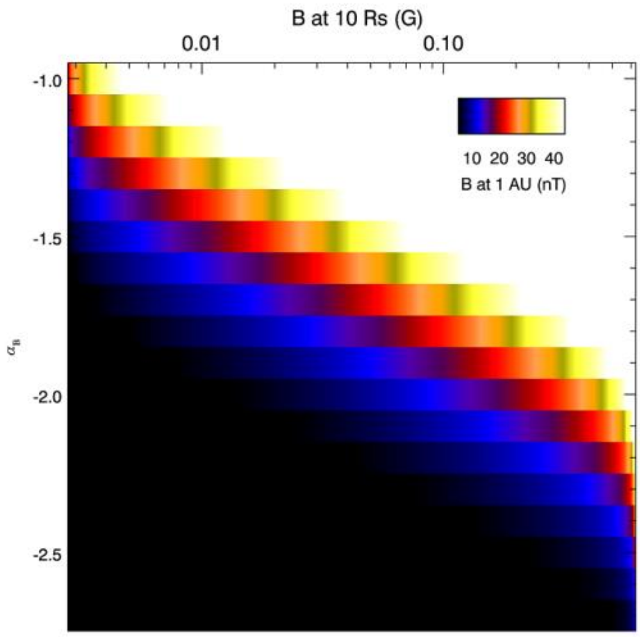

Figure 1. Color representation of the predicted at 1 AU CME magnetic field magnitude for 10^4 synthetic CMEs as a function of the near-Sun CME magnetic field and αB. The synthetic CMEs result from Monte-Carlo simulations using the H-CME method. Colors different from black and white correspond to predicted CME magnetic field magnitude values inside the range of in-situ observations of ICMEs at 1 AU (e.g., Lynch et al. 2003; Lepping et al. 2006). From Patsourakos & Georgoulis (2016).

1 http://solar.gmu.edu/heliophysics/index.phpWorking_Group_5
2 https://ccmc.gsfc.nasa.gov/assessment/topics/helio-imf-bz.php

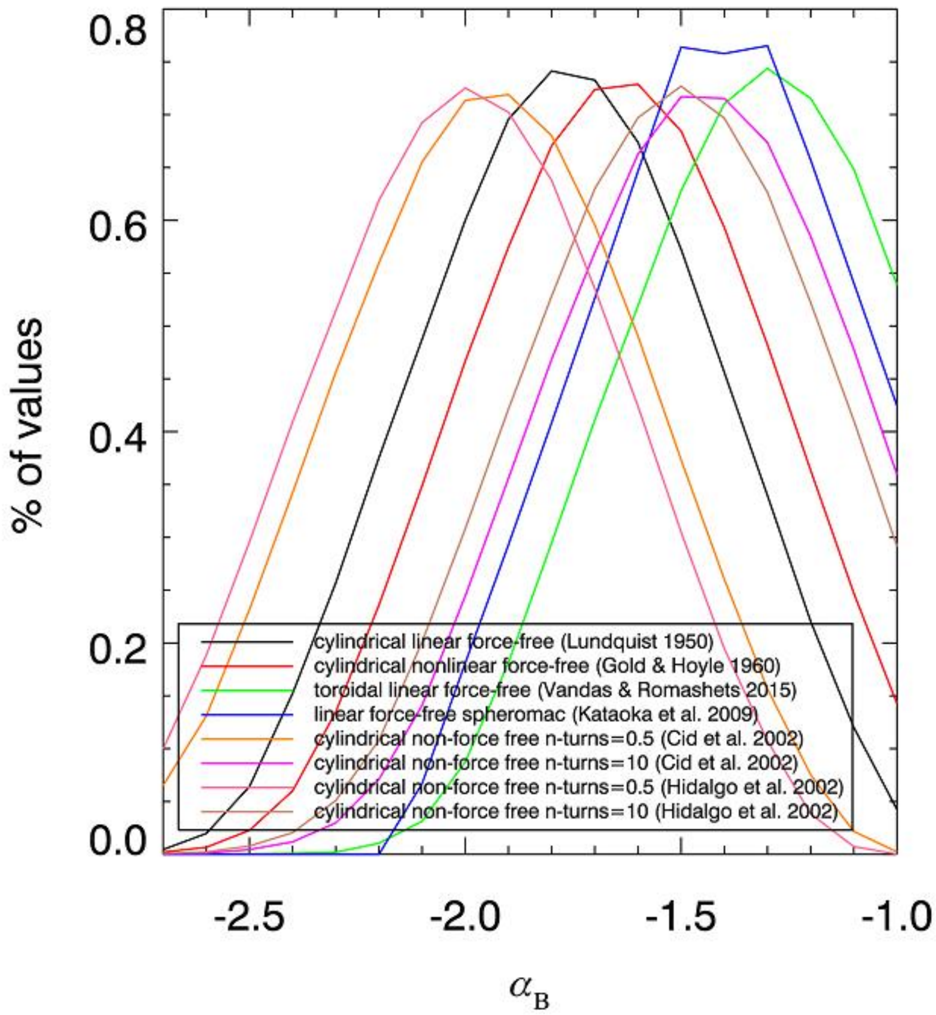

Figure 2. Fraction of the predicted at 1 AU CME magnetic field magnitude for 10^4 synthetic CMEs which falls within the range of in-situ observations of ICMEs at 1 AU (e.g., Lynch et al. 2003; Lepping et al. 2006). Results from Monte-Carlo simulations using the H-CME method for different CME models. From Patsourakos & Georgoulis (2017).

WG5 action items for the near future could include the following:

1) Benchmarking of near-Sun CME magnetic field inference methods.
2) Near-Sun CME magnetic field inferences could be used to constrain magnetized heliospheric CME models (e.g., Shen et al. 2014; Odstrcil 2016; Shiota & Kataoka 2016; Pomoell et al. 2017).
3) Pursue synergies with other teams (e.g., IMF Bz at L1 Working Team[2]), radio assets (e.g., NRH, MWA, LOFAR) and eventually use data from the upcoming Parker Solar Probe and Solar Orbiter missions which will set strong constraints on near-Sun and heliospheric CME magnetic fields.

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Article 3:

Database of Directivity Functions of Neutron Monitors

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Tigran Karapetyan


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The database of Directivity Functions (DF) for Neutron Monitors (NM) has created to provide the graphs of directional sensitivities of all acting NMs. The last is necessary to know when using the data of NM in space researches. Until now, there was no comprehensive information of directional sensitivity of the NMs. In rare cases, approximate estimates were made for several NMs. Recently developed concept of DF [1, 2] significantly improved determination of directional sensitivity of NM and raised a need to derive the DFs of all acting NMs. This database solves this problem by providing the DFs of 39 NMs.

Directivity function defines the contribution of primary cosmic ray protons, arriving from different asymptotic directions to the counting rate of monitor, so it describes directional sensitivity of monitor to primary protons. Knowledge of DFs of acting NMs opens the opportunity to use their large database in researches, where precise asymptotic directions of primary protons is required to know. Some of the topics of these researches are: cosmic rays anisotropy, precursors of coronal mass ejection and geomagnetic storms.

To create the database we developed the computation code, which acounts asymptotic directions of primary protons with different energies, falling on the atmosphere at inside a ~60° vertical cone. We use the 3° step size of zenith angle (q = 3°, 6°,…60°) and 3°/sin (q) step size of polar angle, which gives 1212 falling directions evenly filling the 60° cone. Each direction corresponds to a dot in geographic coordinates. The dots are binned according to their asymptotic longitude and latitude with weight coefficients, accounting differential spectrum of primary protons and yield function of NM.

In the result the DF is derived, representing directional sensitivity of NM to primary protons in geographic coordinates. Obtained DFs show that their shapes are very different for high, middle and low latitudes NMs. While high latitudes NMs have narrow DF, the DFs of NMs, located at middle and low latitudes are wide, having complicated forms. As an example, in Fig.1 there are presented the DFs of 4 NMs.

The database contains DFs of 39 NMs, presented as color coding graphs. The color-coding gives the flux of primary galactic protons from blue (no contribution) to red (maximum contribution).

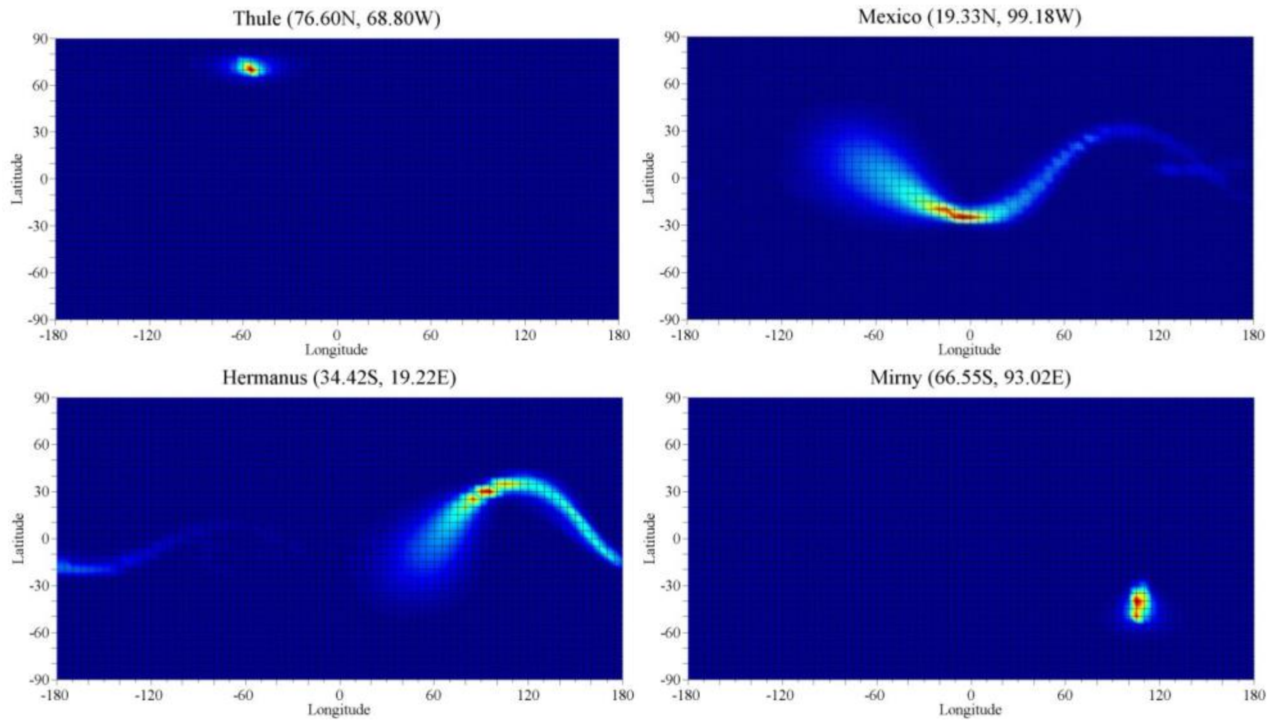
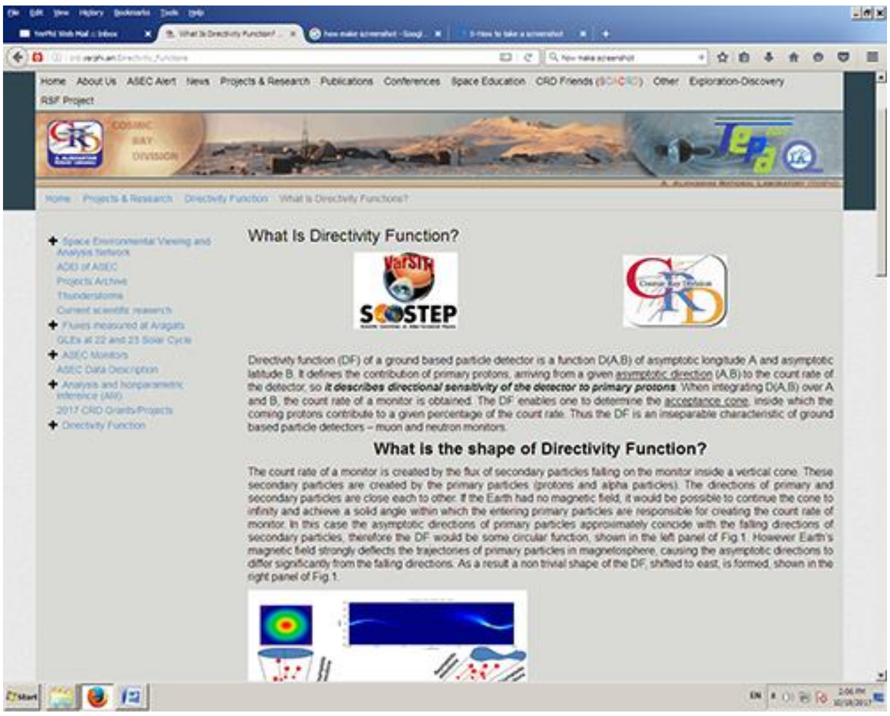


Figure 1. Directivity functions of Thule, Mexico, Hermanus and Mirny NMs in geographic coordinates. The color-coding gives the flux of protons from purple (no contribution) to red (maximum contribution).

The database is accompanied by the manual, which presents the concept of directivity function and explains the graphs. The screenshot of first page of manual is presented below.



The database is free of use, the users can redistribute, modify and use the graphs for any purposes except of commercial use. The web page of the database is:

http://crd.yerphi.am/Directivity_Functions_Neutron_Monitors

Acknowledgement

We acknowledge VarSITI for supporting creation of the database.

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Article 4:

Creation of a Database for Atmospheric and Whistler Events Detected in the Russian Far East

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The new software-hardware complex of IKIR FEB RAS «Sensor signal analysis network» (SSAN) for distributed, time synchronized monitoring of Very Low Frequency (VLF) radiation allows us to solve a number of problems associated with investigation of lightning activity, monitoring of whistler and search for their lightning sources, monitoring of volcano explosive eruptions in Kamchatka and of cyclone structures in the atmosphere over oceans. Besides the scientific aims, investigation of these tasks has a clear application component. Whistlers, as natural markers of plasmosphere state, are of great interest for space weather forecast. Radio pulses of lightning discharges during propagation along the Earth surface via the Earth-ionosphere waveguide carry information on synoptic weather system structure. Volcano explosive eruptions may also be accompanied by lightning discharges which may be applied to detect volcanic eruptions in the conditions of dense cloudiness.

Each SSAN endpoint (Fig. 1) can analyze the time synchronized signals and transmit the collected information to one or several collecting centers. Signal from the antenna comes to a pre-amplifier and then to ADC. PPS signal from Glonass/GPS module also comes to the ADC that allows us to make time synchronization of the measurements at different SSAN nodes. NMEA 0183 signal comes to a mini-computer to set the system time and to determine the SSAN node location. After digitization, the general signal comes to the mini-computer for stream processing (Fig. 2). For VLF signal detection we use magnetic and vertical electric antennas (Fig. 3).

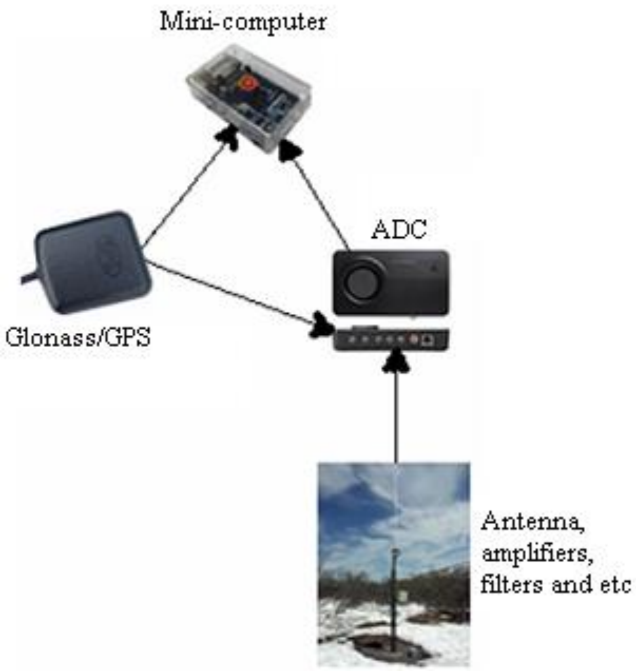

Figure 1. Example of SSAN endpoint for monitoring of natural electromagnetic radiation sources.

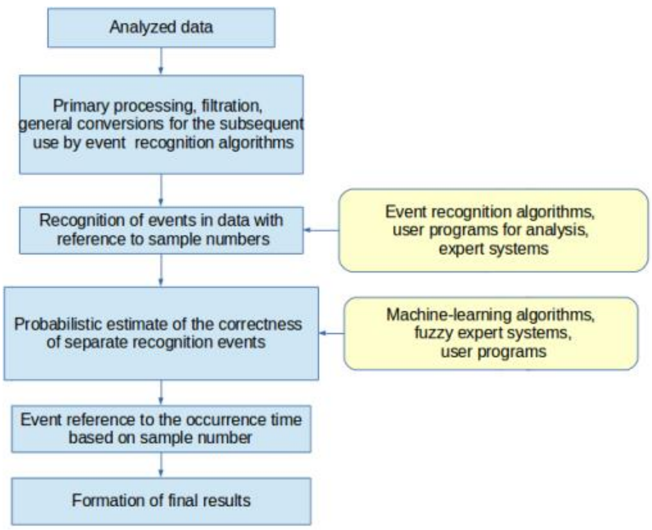

Figure 2. Generalized functional scheme of signal stream analysis by SSAN endpoint.

Figure 3. Some types of antennas used in IKIR FEB RAS and SHICRA SB RAS for VLF signal detection.

Figure 4. Autonomy of the ground-based radio physical station «Oibenkel» of SHICRA SB RAS.

The VarSITI have decided to support IKIR FEB RAS database construction entitled "Creation of a database for atmospheric and whistler events detected in the Russian Far East" (http://www.ikir.ru/en/Departments/Paratunka/lre/Events/varsiti-2017.html). The database is divided into folders according to the location of the monitoring station and the used algorithm for atmospheric and whistler detection. The database stores files both in text format and in Java-serialized. In November 2017, synchronous registration of atmospherics and whistlers by SSAN complexes in the radio physical observation stations in Paratunka and in Yakutsk began in the operational mode. An important feature of these stations is that the power supply of the recording equipment, which is far from the industrial noises, is autonomous (Fig. 4). In the test mode, registration is carry out in the city Vladivostok

Many years of experience in IKIR FEB RAS and SHICRA SB RAS allows in the future on the basis of synchronous registration of electromagnetic radiation (EMR), with the help of the created sensor network, to conduct remote monitoring of EMR, the source of which are not only lightning, but also signals of VLF-transmitters, magnetospheric sources in the ELF range and much more.

Highlight on Young Scientists 1:

Considerations in D-region Ionospheric Imaging


Jackson McCormick

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Very Low and Low Frequency Waves (VLF/LF) are the most commonly used method to study the D-region of the ionosphere (~60-90 km). The two most common sources of VLF/LF sources are navy VLF/LF transmitters and naturally generated VLF/LF broadband emissions from lightning known as 'sferics'.

While there is a rich history of D-region studies utilizing transmitters, lighting is much more widely distributed in space but has not been as extensively utilized [1].

A recent study [2] discusses the potential importance of utilizing both amplitude and phase on both horizontal magnetic field components. I discuss a technique to recover amplitude and phase of both magnetic field components of sferics in a paper in review [3].

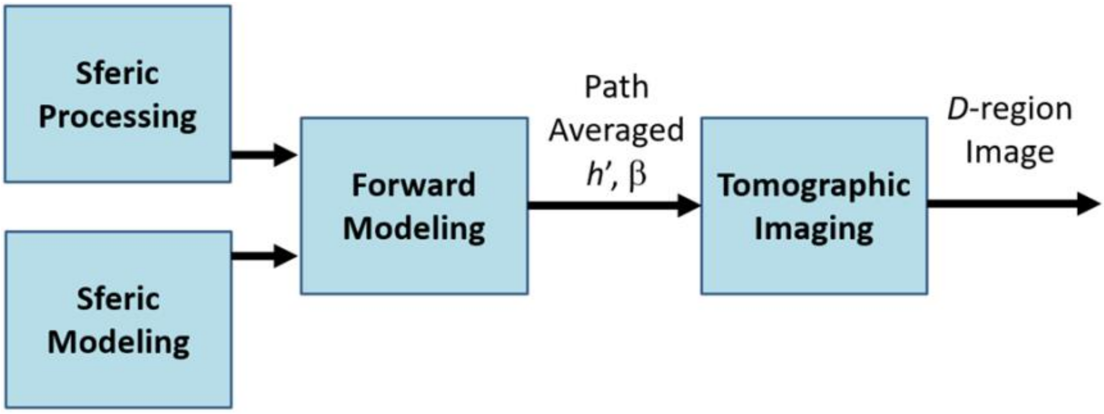

Figure 1. Block diagram of the approach to produce a D-region ionospheric map.

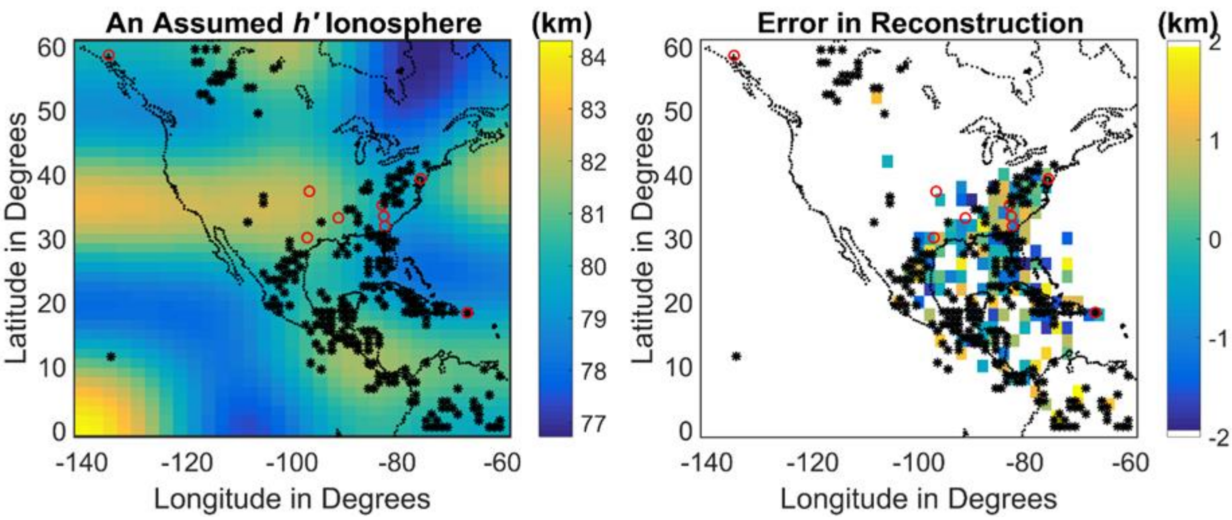

Figure 2. The left panel shows an assumed *h'* ionosphere. In both panels lightning strokes are shown as black stars, while Georgia Tech LF receivers are shown as red circles. The right panel shows pixels recovered within 2 km of error.

I simulate sferics with Long Wave Propagation Capability (LWPC) code using the Wait and Spies parameterization of the D-region [4] (h',β) interpreting the best match as the average along the source-receiver path.

Because this technique doesn't depend on specific sferic features or geometries, I am able to expand our measurement to global scales. Currently I am working on using the large available dataset of path-averaged measurements to recover a 2D ionospheric map using modern imaging and tomographic techniques. Early results are shown in Figure 2.

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Highlight on Young Scientists 2:

Forbush decrease model for expanding CMEs (ForbMod)

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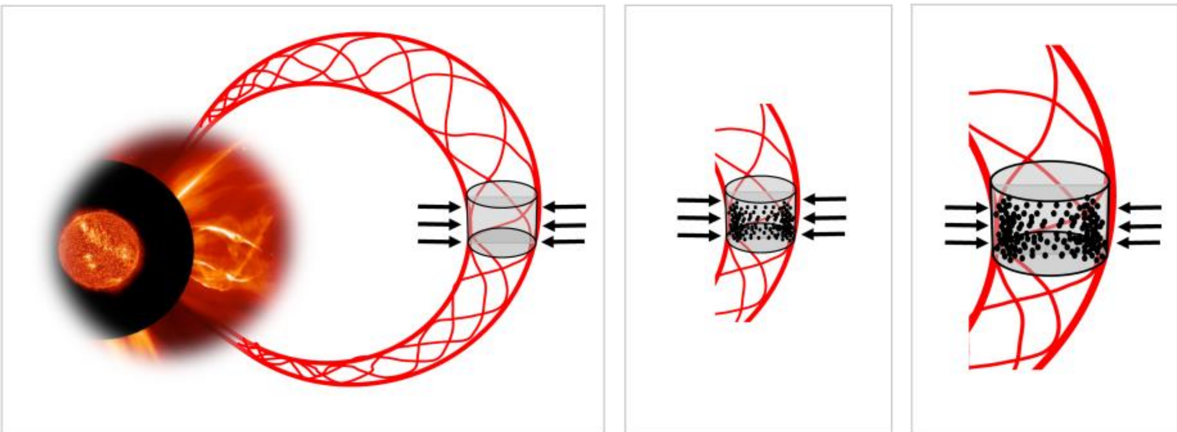
Mateja Dumbović

Forbush decreases (FDs) are depressions in the galactic cosmic ray flux observed around the passage of enhanced magnetic field structures from, e.g., coronal mass ejections (CMEs). Understanding FDs can help us to better understand magnetic structures causing Space Weather. For this, we developed an analytical diffusion-expansion FD model ForbMod [6], which is constrained by remote CME measurements taking into account different types of CME expansion (Figure 1).



(a) (b) (c)

Figure 1. a) A sketch of the initial CME for both diffusion-only and diffusion–expansion model: CME is a closed magnetic structure locally of the cylindrical form, rooted at the Sun and initially empty of GCRs; b) A sketch of the diffusion-only model after time t: CME does not vary in shape or size; c) A sketch of the diffusion-expansion model after time t: CME expands self-similarly. In both cases particles enter CME by perpendicular diffusion.

Highlight on Young Scientists

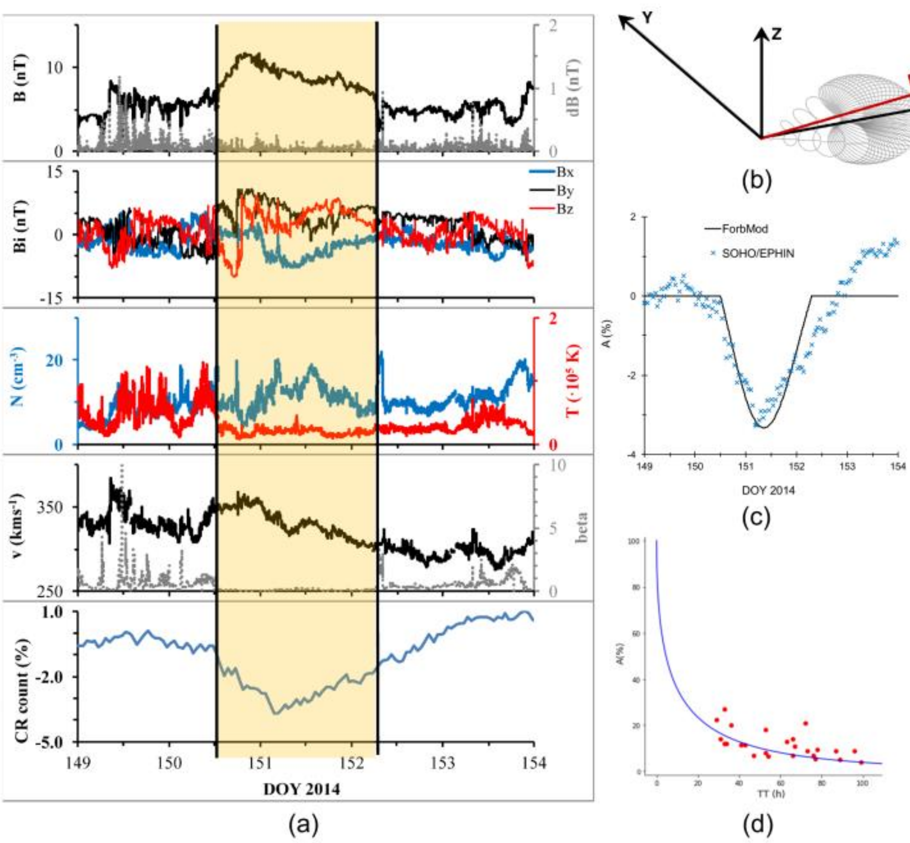


Figure 2. a) CME in situ measurements (first 4 panels) and a corresponding FD observed in SOHO/EPHIN; b) 3D CME reconstruction using GCS (in HEEQ system); c) best-fitted ForbMod FD radial-profile converted to time-profile and compared to SOHO/EPHIN measurements; d) FD magnitude time evolution for the best-fitted case (blue line) vs. observation taken from [3].

Qualitatively, the model is able to simulate a symmetric radial profile and FD amplitude monotonically decreasing with time, as observed [1,3]. A quantitative study is given on the CME from 2014 May 25-30 (Figure 2a). We performed a 3D reconstruction using the Graduated Cylindrical Shell model [4] to obtain the initial CME radius (a_0=3.5 R_{sun} at distance R_0=18.2 R_{sun}, Figure 2b). Treating the diffusion coefficient D_B as a free parameter, ForbMod radial FD profile was best-fitted to observational FD time-profile by EPHIN/SOHO detector [5] with $D_B=0.68\cdot 10^{19}$ cm^2s^{-1} (Figure 2c). We find that the time evolution curve of the depression amplitude for D_B corresponds to statistical results [3] (Figure 2d).

This research has received funding from the EU's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 745782 (ForbMod).

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Project ROSMIC

Meeting Report 1:

IRI 2017 Workshop, National Central University, Taoyuan City, Taiwan, November 13-17

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The IRI-2017 Workshop brought together 85 researchers from 23 countries to discuss the status and improvement of the International Reference Ionosphere (IRI) model with special emphasis on the low latitude region and on the development of the Real-Time IRI. The 68 presentations were distributed into sessions covering ‘GNSS and Radio Occultation’, ‘Scintillation’, ‘F-peak and above’, ‘Irregularities and Anomalies’, ‘Storm Modelling’, ‘Ion Composition, Temperatures, and Ion Drift’, ‘New Inputs for IRI’, ‘Student Presentations’, ‘Final Discussions’, and a Poster Session. As a result of the presentations and discussions at the workshop significant improvements will be included with the next version of IRI.The best student presentations were rewarded with Gold, Silver and Bronze Awards. Jann-Yeng (Tiger) Liu was elected to become a new member of the IRI Working Group. The next IRI workshop is planned to be held at the Frederick University in Cyprus in September 2019. Papers from the workshop will form the core of a special issue of Advances in Space Research on “Improved Real-Time Ionospheric Predictions with IRI and Formosat -3/COSMIC and other GNSS Data”. The workshop was supported by VarSITI, by the Taiwanese Ministry of Science and Technology, by NCU through its Center for Space and Remote Sensing Research (CSRSR) and its Graduate Institute of Space Science (GISS), and by COSPAR.

Figure 1. Group Photo of the IRI-2017 Workshop.

Project ISEST

Meeting Report 2:

ISEST (International Study of Earth-Affecting Solar Transients) Workshop in 2017

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Jie Zhang

Kyungsuk Cho

The annual ISEST International Workshop in 2017 was held in Jeju, Korea, September 18 - 22, 2017. The ISEST, one of the four SCOSTEP/ VarSITI projects, is aimed at bringing together scientists from different countries to interact and establish collaboration links that can effectively address the physical mechanisms of the origin, propagation, and Earth impact of solar transient events, including coronal mass ejections (CMEs), solar energetic particle events (SEPs) and corotating interacton regions (CIRs). Thirty-seven experts and students from eleven countries participated in this workshop. Leaders from all seven Working Groups (data-1, theory-2, simulation-3, campaign-4, Bs challenge-5, SEP-6 and MiniMax24-7) made progress reports in the beginning and summary reports in the end of the workshop. Rigorous and fruitful discussions were a trademark of the five-day-long workshop. The meeting website is hosted at http://kswrc.kasi.re.kr/Workshop/isest2017 . All presentations and WG reports, along with data products, are archived and publicly available at the ISEST WIKI Website at “http://solar.gmu.edu/heliophysics/index.php/Main_Page”.

Figure 1. Group Picture of 2017 ISEST Workshop Participants.

Upcoming meetings related to VarSITI

Conference	Date	Location	Contact Information
13th conference Plasma Physics in the Solar System	Feb.12-16, 2018	Moscow, Russia	https://plasma2018.cosmos.ru/en
Dynamic Sun: II: Solar Magnetism from Interior to the Corona	Feb. 12-16, 2018	Siem Reap, Angkor Wat, Cambodia	http://star-lab.group.shef.ac.uk/Conferences/Cambodia_2018/
IAU Symposium 340: Long–Term Datasets for the Understanding of Solar and Stellar Magnetic Cycles	Feb. 19-24, 2018	Jaipur, India	https://www.iiap.res.in//iaus340/
AGU Chapman Conference: Particle Dynamics in the Earth's Radiation Belts	Mar. 4-9, 2018	Cascais, Portugal	http://chapman.agu.org/particle-dynamics/
International School on Equatorial and Low Latitude Ionosphere (ISELION 2018)	Mar. 5-9, 2018	Bandung, Indonesia	http://pussainsa.sains.lapan.go.id/event/iselion2018/
41th Annual Seminar on Physics of the Auroral Phenomena	Mar. 12-16, 2018	Apatity, Murmansk region, Russia	http://pgia.ru/seminar/
VLF/ELF Remote Sensing of Ionospheres and Magnetosphere (VERSIM) 8th Workshop	Mar. 19-23, 2018	Apatity, Murmansk region, Russia	http://pgi.ru/conf/view?eventId=1
EGU General Assembly 2018	Apr. 8-13, 2018	Vienna, Austria	https://www.egu2018.eu/
DKIST Critical Science Plan Workshop 5: Wave generation and propagation	Apr. 9-11, 2018	Newcastle upon Tyne, UK	http://eclipse2017.nso.edu/science/dkist/dkist-critical-science-plan/workshop-5/
4th International ANGWIN Workshop: Exploration of High-latitude Upper Atmosphere Wave Dynamics	Apr. 24-26, 2018	São José dos Campos, Brazil	http://www.inpe.br/angwin/
10th International Workshop on "Long-Term Changes and Trends in the Atmosphere"	May 14-19, 2018	Hefei, China	http://trends2018.ustc.edu.cn/home.html
10th Workshop "Solar Influences on the Magnetosphere, Ionosphere and Atmosphere"	May 30-Jun. 3, 2018	Sunny Beach, Bulgaria	http://ws-sozopol.stil.bas.bg/
15th AOGS Annual Meeting	Jun. 3-8, 2018	Honolulu, Hawaii, USA	http://www.asiaoceania.org/aogs2018/public.asp?page=home.htm
6th International conference "Atmosphere, ionosphere, safety"	Jun. 3-9, 2018	Kaliningrad, Russia	http://www.ais2018.ru/
2018 GEM Workshop	Jun. 17-22, 2018	Santa Fe, NM, USA	http://aten.igpp.ucla.edu/gemwiki/index.php/Main_Page
2018 CEDAR Workshop	Jun. 24-29, 2018	Santa Fe, NM, USA	https://cedarweb.vsp.ucar.edu/wiki/index.php/2018_Workshop:Main
7th IAGA/ICMA/SCOSTEP workshop on Vertical Coupling in the Atmosphere-Ionosphere System	Jul. 2-6, 2018	Potsdam, Germany	https://www.gfz-potsdam.de/en/section/space-geodetic-techniques/topics/vcais-2018/vcais-2018/

Conference	Date	Location	Contact Information
SCOSTEP 14th Quadrennial Solar-Terrestrial Physics Symposium	Jul. 9-13, 2018	Toronto, Canada	http://www.scostepevents.ca/
42nd COSPAR Scientific Assembly	Jul. 14-22, 2018	Pasadena, CA, USA	https://www.cospar-assembly.org/
7th Symposium of Brazilian Space Geophysics and Aeronomy Society (SBGEA)	Aug. 6-10, 2018	Santa Maria-RS, Brazil	http://www.sbgea.org.br/vii-sbgea/
Annual African Geophysical Society (AGS) Conference on Space Weather	Sep. 24-27, 2018	Cairo, Egypt	http://www.spaceweather.edu.eg/AGS2018.html
ISEST 2018 Workshop XVIth Hvar Astrophysical Colloquium	Sep. 24-28, 2018	Hvar, Croatia	http://oh.geof.unizg.hr/index.php/en/meetings/184-isest-2018
15th International Symposium on Equatorial Aeronomy	Oct. 22-26, 2018	Ahmedabad, India	http://www.prl.res.in/isea15

Project ROSMIC

Short News

Short News 1:

Continuation of the German ROMIC project

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Franz-Josef Lübken

The German ministry for Science and Education (BMBF) has announced a second phase for ROMIC on October 25, 2017. ROMIC (Role of the Middle Atmosphere to climate) is a national research program in Germany closely related to the VarSITI project ROSMIC. Within the first phase of ROMIC, which covered the period 2013 to 2017, a total of 18 projects at 15 institutes were funded (total: appr. 8 Mio Euro). Several topics were covered, such as solar forcing and long term trends in the middle atmosphere, coupling by gravity waves and tides, and aerosol science. More details can be found on the webpage of ROMIC: https://romic.iap-kborn.de/romic/strategie/.

We are happy that BMBF decided to launch a second period of ROMIC. The deadline for applications is 31 January 2018 and the expected duration is again 3-4 years. We hope that the German science community can continue to play an active role in the future program of SCOSTEP.

The purpose of the VarSITI newsletter is to promote communication among scientists related to the four VarSITI Projects (SEE, ISEST/MiniMax24, SPeCIMEN, and ROSMIC).

The editors would like to ask you to submit the following articles to the VarSITI newsletter.

Our newsletter has five categories of the articles:

1. Articles— Each article has a maximum of 500 words length and four figures/photos (at least two figures/photos).
   With the writer's approval, the small face photo will be also added.
   On campaign, ground observations, satellite observations, modeling, etc.
2. Meeting reports—Each meeting report has a maximum of 150 words length and one photo from the meeting.
   With the writer's approval, the small face photo will be also added.
   On workshop/conference/ symposium report related to VarSITI
3. Highlights on young scientists— Each highlight has a maximum of 200 words length and two figures.
   With the writer's approval, the small face photo will be also added.
   On the young scientist's own work related to VarSITI
4. Short news— Each short news has a maximum of 100 words length.
   Announcements of campaign, workshop, etc.
5. Meeting schedule

Category 3 (Highlights on young scientists) helps both young scientists and VarSITI members to know each other. Please contact the editors if you know any recommended young scientists who are willing to write an article on this category.

TO SUBMIT AN ARTICLE

Articles/figures/photos can be emailed to the Newsletter Secretary, Ms. Mai Asakura (asakura_at_isee.nagoya-u.ac.jp). If you have any questions or problem, please do not hesitate to ask us.

SUBSCRIPTION - VarSITI MAILING LIST

The PDF version of the VarSITI Newsletter is distributed through the VarSITI mailing list. The mailing list is created for each of the four Projects with an integrated list for all Projects. If you want to be included in the mailing list to receive future information of VarSITI, please send e-mail to "asakura_at_isee.nagoya-u.ac.jp" (replace "_at_" by "@") with your full name, country, e-mail address to be included, and the name of the Project you are interested.

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