EGU2020 Online | 4–8 May 2020

Public information

We invite presentations on various space weather and space climate-related activities in the Sun-Earth system: forecast and nowcast products and services; satellite observations; model development, validation, and verification; data assimilation; development and production of geomagnetic and ionospheric indices. Talks on space weather effects on applications (e.g. on airlines, pipelines and power grids, space flights, auroral tourism, etc.) in the Earth's environment are also welcomed.

Initial agenda*

Total submitted contributions: **26** (7 orals and 19 posters).
A number of contributions presented online as orals: **5**.
A number of contributions presented online as posters: **9**.
A number of contributions not presented but submitted: **1**.
A number of contributions not presented and not submitted: **4**.
A number of contributions with no information provided: **7**.

* This numbers are based on online information at https://meetingorganizer.copernicus.org/EGU2020/displays/36062 on 10 May 2020 (see screenshot at the end of this document).

Modified online Agenda

08:30 - (**poster**) D3144 | EGU2020-18174 - Antonio Guerrero et al.

Agenda - Orals

08:36 - D3123 | EGU2020-7386 - Eelco Doornbos et al.
08:46 - D3124 | EGU2020-6646 - Jürgen Matzka et al.
08:56 - D3125 | EGU2020-22086 - Seán Blake et al.
09:06 - D3128 | EGU2020-9196 - Mihail Codrescu et al.
09:16 - D3129 | EGU2020-7702 - Elena Marshalko et al.

Agenda - Posters

09:26 - D3132 | EGU2020-7474 - Kiyonobu Sugihara et al.
09:32 - D3133 | EGU2020-7650 - Harri Haukka et al.
09:38 - D3135 | EGU2020-11371 - Guram Kervalishvili et al.
09:44 - D3137 | EGU2020-22188 - Tom Baltzer et al.
09:50 - D3138 | EGU2020-22144 - Chris Pankratz et al.
09:56 - D3141 | EGU2020-15904 - Jean-Marie Chevalier et al.
10:02 - D3142 | EGU2020-12084 - Christine Gabrielse et al.
10:08 - D3147 | EGU2020-1002 - Joana Alves Ribeiro et al.
10:14 - End

Chat ST4.2 on 04 May, 08:15–10:45

The following chat has been edited and includes only authors introductions.

Guram Kervalishvili GFZ (Convener) (08:27) Good morning everybody, we will start at 08:30! Thank you for the updated information.

08:31 – Display D3144:

Antonio Guerrero UAH (author) (08:31) First, I would like to thank the convener for placing me on my available time. We present new global geomagnetic indices at midlatitude (around 40 degrees MLat) in

order to have more precise of the disturbances. They are similar to high latitude AE, AU, AL and low latitude Dst, SYM-H but this time from six observatories close to 40 degrees Mlat, where the removal of quiet time is specially delicate. The indices are now online updating every 15 mins. You can access them at http://www.spaceweather.es/mid/. User: guest, Pass: invitado. On the presentation you can find references to related work also.

08:37 – Display D3123:

Eelco Doornbos, KNMI, author (08:38) I have combined output of geospace models (such as WACCM-X, TIE-GCM, Tysganenko) and 3D visualisation software to create animations of space weather and space physics phenomenon, and how these are sampled by a satellite. This work is used in the mission definition and outreach activities of the ESA Earth Explorer 10 candidate mission Daedalus, that (if selected) will sample the lower thermosphere-ionosphere at very low altitudes for a satellite. I hope you have been able to view the animations on YouTube, or will do so later. youtube.com/channel/UCDJNwxvy736RR4pkbVV7u5g. More work will appear on this channel in the next weeks and months.

08:47 – Display D3124:

Juergen Matzka GFZ (author) (08:47) D3124: Open-ended, high cadence, Kp-like geomagnetic index Hp The Hp index family (station specific H60 and H30 and global Hp60 and Hp30, where 60 and 30 indicates time resolution in minutes) was introduced last year as a Kp-like index with higher time resolution (high cadence). Now we have adopted it towards an open-ended index. This allows to describe strong geomagnetic storms in a more nuanced way. We plan to publish archive values (back to 1995) and nowcast values by June.

08:56 – Display D3125:

SeanPBlake (08:57) Our presentation details our attempts to recreate the low-latitude Bh measured at Colaba during the Carrington event using the Space Weather Modeling Framework. We find that an extremely high-pressure solar wind profile can reproduce the Colaba dataset by forcing the magnetopause (and adjacent currents) close to the Earth. This scenario results in a Dst somewhere between -347 nT and -973 nT. The presentation can be found here: https://presentations.copernicus.org/EGU2020/EGU2020-22086_presentation.pptx.

09:06 – Display D3128:

Mihail Codrescu NOAA (Author) (09:13) We have developed an ensemble Kalman Filter (enKF) scheme called Thermosphere Ionosphere Data Assimilation (TIDA) that can estimate corrections to the system forcing and improve the thermosphere ionosphere modeling. We can estimate biases between data sets.

09:16 – Display D3129:

Mikhail Kruglyakov ETH Zurich #co-author (09:16) In contrast to pervious topics, we work more with the Earth. We carry out 3-D ground geoelectric field (which drives geomagnetically induced currents) modelling for Fennoscandia. We use 3 different variants of the inducing source: equivalent current constructed on the base of an MHD simulation, SECS equivalent current and plane wave excitation. We compare modelling results and discuss advantages and disadvantages of each source type.

09:26 – Display D3132:

yama@kiruna (09:26) I present for Sugihara's poster D3132 | EGU2020-7474. Auroral activity is evaluated with scaling 0-100 using all-sky camera's jpg images (we call it “local all-sky index”). Evauation is made for diffuse aurora, auroral arc, and auroral arc activity, such that non-specialist can predict break-up 5 minutes before => In the last second page, you can find time profile of the index toward the onset. By combining magnetic field data and multi-station (Kiruna and Abisko), we plan to make prediction more reliable. Computation time is so short that local PC can provide the real-time update.

09:32 – Display D3133:

Harri Haukka, FMI (09:33) Hi all and thank you for participating in this first Online EGU. I am happy to present our PECASUS Space Weather Service Network for Aviation that is one of three global services for ICAO. First i would like to say a few words that what is ICAO, if it is not so well known? International Civil Aviation Organization (ICAO) is: - Works under UN and was established in 1944 - Develops principles and techniques for enhanced safety in civil aviation - Close collaboration with WMO - Wishes to integrate Space Weather (SWx) services to its regulations due to enhanced traffic across the polar caps. Secondly what is PECASUS? PECASUS in nutshell is for service for space weather impacts on aviation ingluding e.g.: - Radiation at flight altitudes - Problems in Global Navigation Satellite Systems (GNSS) & SATCOM - Disturbances in HF communication. And I would you to check our public website in http://pecasus.org/ as well as our excellent overview YouTube video youtube.com/watch?v=xWPdVe7hPlU that introduces the whole PECASUS. Official operations for ICAO have started on November 7, 2019 and we have been now operational about half a year.

09:39 – Display D3135:

Guram Kervalishvili GFZ (Convener) (09:40) D3135: Some preliminary results on the development of the local Dst index based on the Tristan da Cunha (TDC), South Atlantic magnetic observatory for years 2009-2016 are presented. This activity is a part of ESA's SSA SWE G-ESC Network. This local index is intended to be derived also for the following low- and mid-latitude observatories: St. Helena (SHE, South Atlantic), Keetmanshoop (KMH, Namibia), Vassouras (VSS, Brazilian), Gan (GAN, Maldives), and Panagjurishte (PAG, Bulgaria). All conclusion and result presented are preliminary. Validation work is in progress. The local Dst index is derived for the single magnetic observatory as follows. First, the baseline (quiet curve) is defined for the H-component of the magnetic field. The baseline is calculated using the given numbers of quiet days over the defined time interval. Second, ΔH is calculated for each day by subtracting the baseline. Third, the Solar quiet (Sq) variations are determined for each month using the ΔH values from the quiet days.

09:46 – Display D3137:

Tom Baltzer CU Boulder SWx TREC (author) (09:49) As part of the University of Colorado's Space Weather Technology, Research and Education Center (SWx TREC): https://www.colorado.edu/spaceweather/, last year, we introduced a prototype Space Weather Data Portal for accessing myriad datasets to describe space weather events from Sun to Earth. Since then, we have added numerous datasets included a new category to better differentiate datasets, honed the functionality of our plotting and display tools, improved our tutorials and made our public release at AGU 2019. After our initial release, we've continued adding datasets and features, and worked closely with members of the space weather community to meet their needs for research and education. Please visit our portal at: https://lasp.colorado.edu/space-weather-portal/home I am also more than happy to schedule a Zoom session for demonstrating our capabilities. Please contact me at: Thomas.Baltzer@lasp.colorado.edu. For more information about SWx TREC, please see the next presentation by Pankratz et al.

09:52 – Display D3138:

Chris Pankratz UnivOfColorado (author) (09:53) Thanks you and good morning. For my presentation, D3138, I chose to upload a series of PowerPoint slides instead of a poster, as I felt that format would lend itself better to this year's virtual session. My presentation is an update on progress at the Space Weather Technology, Research and Education Center at the University of Colorado, Boulder in the USA. Our academic center strives to meet the growing needs of the space weather research and operations domains by educating the current and next generations, performing cutting edge research contributions, and providing missions, applications, and data technologies. My presentation provides a brief overview of this center and

our publicly-available Space Weather Data Portal, and provides additional details on a community-accessible R2O-O2R Testbed Environment that we have developed to support model, data, and visualization development, accessibility, and transition.

09:59 – Display D3141:

Jean-Marie Chevalier (10:01) Good morning, and thank you. The presentation presents a warning system for Solar Radio Burst (SRB) interfering the GNSS signal reception. It is based on the monitoring of Carrier to Noise density ratio (C/N0) observations from the GNSS EPN network. The presentation summarizes the monitoring of the last 5 years.

10:05 – Display D3142:

Christine Gabrielse, Aerospace Corp. (10:05) Thanks for letting me join this session! While I'm not new to the magnetosphere, I am a newer face in the applied space weather field. There are times when more precisely determined particle fluences are desired for post-anomaly investigation than what a statistical model may provide (e.g., AE9). We use the seven-year Van Allen Probes mission to create a daily-averaged electron flux model (RB-Daily-E), binning fluxes by L shell, pitch angle, and energy. This allows us to estimate the electron flux observed by a secondary satellite that may have a different orbit and inclination. Larger L shell fluxes were filled in by THEMIS statistics. We then fly a secondary satellite through the model, such as Arase, or GPS, to determine the fluences observed. We had a good comparison to actual Arase electron flux data. Fluences can be determined for GPS, and utilized to look into satellite anomalies, solar panel degradation rates, etc., during the Van Allen Probe era. RB-Daily-E is therefore not a predictive model, but rather meant for post-event analysis.

10:11 – Display D3147:

J. Alves Ribeiro UC (author) (10:11) D3147: We present here a study of the Geomagnetically Induced Currents (GIC) risk hazard for the south Portuguese power network. We use realistic grid parameters provided by REN (Redes Energéticas Nacionais) and a conductivity model that takes into account the proximity to the sea, to compute GICs at the time of the geomagnetic storm of 17th March of 2015 (St. Patrick Storm). We see a linear polarization of the source geomagnetic field. Any suggestion which could be the origin?

10:19 – Start of the open discussions, the chat will be open until 10:45.

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Displays

ST4.2
Nowcasting, forecasting, operational monitoring and post-event analysis of the space weather and space climate in the Sun-Earth system
Convener: Guram Kervalishvili | Co-conveners: Therese Moretto Jorgensen, Yulia Bogdanova, Alan Thomson, Claudia Borries
Displays | Mon, 04 May, 08:30–10:15 (CEST)

Files for download

Download all presentations (128MB)

Chat time: Monday, 4 May 2020, 08:30–10:15

Chairperson: Guram Kervalishvili, Yulia Bogdanova

D3123 | EGU2020-7386 | solicited | Highlight
Visualizing models and observations of the thermosphere-ionosphere in support of the ESA EE10 candidate mission Daedalus
Eelco Doornbos, Theodoros Sarris, Stylianos Tourgaidis, Panagiotis Pirnaris, Stephan Buchert, Hanli Liu, Gang Lu, and Federico Gasperini

D3124 | EGU2020-6646 | Highlight
Open-ended, high cadence, Kp-like geomagnetic index Hp
Jürgen Matzka, Guram Kervalishvili, Jan Rauberg, Claudia Stolle, and Yosuke Yamazaki

D3125 | EGU2020-22086
Recreating the Carrington Event Magnetic Field Measurements using Extremely High Pressure Solar Wind Scenarios and the Space Weather Modelling Framework
Seán Blake, Antti Pulkkinen, Pete Schuck, and Alex Glocer

D3126 | EGU2020-12209
Low-Earth-Orbit observations for space weather and space climate
Irina Zakharenkova, Iurii Cherniak, Sergey Sokolovskiy, William Schreiner, Qian Wu, and John Braun

D3127 | EGU2020-17747
Reanalysis of ring current electron phase space densities using Van Allen Probe observations, convection model, and log-normal Kalman filter
not presented
Nikita Aseev and Yuri Shprits

D3128 | EGU2020-9196
On Space Weather Data Assimilation
Mihail Codrescu, Stefan Codrescu, Mariangel Fedrizzi, and Claudia Borries

D3129 | EGU2020-7702
Comparing three approaches to the ground geoelectric field modelling due to space weather events
Elena Marshalko, Mikhail Kruglyakov, Alexey Kuvshinov, Elena Sokolova, Viacheslav Pilipenko, and Olga Kozyreva

D3130 | EGU2020-2696
Dispersionless and Weakly Dispersed Injections in the Dayside Magnetosphere with Evidence of Mirror Wave Signatures not presented
Matthew Cooper, Andrew Gerrard, Louis Lanzerotti, Gareth Perry, and Rualdo Soto-Chavez

D3131 | EGU2020-6373
Observing Interplanetary Scintillation with Dual-Antenna Interference
Donghao Liu

D3132 | EGU2020-7474
Evaluation of Aurora Activity Obtained from Abisko and Kiruna Ground Based Observation
Kiyonobu Sugihara, **Masatoshi Yamauchi**, Makoto Kobayashi, Shin Koichi, and Masahiro Nishi

D3133 | EGU2020-7650
PECASUS - ICAO Designated Space Weather Service Network for Aviation
Harri Haukka, Ari-Matti Harri, Kirsti Kauristie, Jesse Andries, Mark Gibbs, Peter Beck, Jens Berdermann, Loredana Perrone, Bert van den Oord, David Berghmans, Nicolas Bergeot, Erwin De Donder, Martin Latocha, Mark Dierckxsens, Haris Haralambous, Iwona M Stanisławska, Volker Wilken, Vincenzo Romano, Martin Kriegel, and Kari Österberg

D3134 | EGU2020-7933
Effect of selecting different simulation configurations on the prediction performance of the Space Weather Modeling Framework regarding ground magnetic perturbations not presented
Norah Kaggwa Kwagala, Michael Hesse, Therese M. Jorgensen, Paul Tenfjord, Cecilia Norgren, Gabor Toth, Tamas Gombosi, Håkon M. Kolstø, and Susanne F. Spinnangr

D3135 | EGU2020-11371
Development of a local nowcast magnetospheric ring current index based on geomagnetic observatory data
Guram Kervalishvili, Claudia Stolle, and Jürgen Matzka

D3136 | EGU2020-10195
Unreliable IAGA-endorsed Polar Cap (PC) index series and a different approach
Peter Stauning

D3137 | EGU2020-22188 | solicited
SWx TREC: Further Developments on an Integrative Space Weather (SWx) Data Portal
Tom Baltzer, Greg Lucas, Chris Pankratz, Jennifer Knuth, and Doug Lindholm

D3138 | EGU2020-22144 | solicited
The SWx TREC Integrative Space Weather Data Portal and Model/Algorithm Testbed Environment
Chris Pankratz, Thomas Baltzer, Greg Lucas, James Craft, Thomas Berger, Daniel Baker, Jennifer Knuth, and Allison Jaynes

D3139 | EGU2020-20318
Variability of ionospheric parameters by the Swarm satellites for different solar activity
Daria Kotova, Yaqi Jin, and Wojciech Miloch

D3140 | EGU2020-1692
A scheme for forecasting severe space weather
Balan Nanan

D3141 | EGU2020-15904 | solicited
Solar radio burst interference index dedicated to GNSS single and double frequency users
Jean-Marie Chevalier, Nicolas Bergeot, Pascale Defraigne, Christophe Marque, and Elisa Pinat

D3142 | EGU2020-12084
An Empirical Model of Electron Flux from the Seven-Year Van Allen Probe Mission
Christine Gabrielse, James Roeder, Justin Lee, Seth Claudepierre, Drew L. Turner, T. Paul O'Brien, Joseph Fennell, and J. Bern Blake

D3143 | EGU2020-12822
New topside ionosphere model based on Vary-Chap function using radio occultation and topside sounder data
Mengjie Wu

D3144 | EGU2020-18174
Realtime geomagnetic indices for mid-latitudes. MID-R, MID-E, MID-U and MID-L
Antonio Guerrero, Elena Saiz, and Consuelo Cid

D3145 | EGU2020-13024
Forecasting of the Upper Atmosphere via Assimilation of Electron Density Data
Timothy Kodikara

D3146 | EGU2020-18978
Relationship Between Ionosphere VTEC and Space Weather Indices for Machine Learning-based Model Development not presented
Randa Natras and Michael Schmidt

D3147 | EGU2020-1002
MAG-GIC: Geomagnetically Induced Currents risk hazard in the Portuguese power network
Joana Alves Ribeiro, Maria Alexandra Pais, Fernando J. G. Pinheiro, Fernando A. Monteiro Santos, and Pedro Soares

D3148 | EGU2020-10909
Improving solar wind forecasts using data assimilation
Matthew Lang, Mathew Owens, and Amos Lawless