TCS Geomagnetic observations

Maxim Yu. Smirnov[1] , Pavel Hejda[2], Juliane Hubert[3], Oliver Ritter[7], Simon Flower[3] ,Aude Chambodut[4], Juan-Jose Curto[5], Jürgen Matzka[7], Alan Thomson[3], Ari Viljanen[6] Thorkild M. Rasmussen[1], Anne Neska

[1]Luleå University of Technology, Sweden (LTU), [2]Institute of Geophysics of the CAS, Prague, Czech Rep. (IG), [3]British Geological Survey, Edinburgh, UK (BGS) [4]IPGS, EOST, Strasbourg, France (EOST), [5]Ebro Observatory, Roquetes, Spain (OE),[6]Finnish Meteorological Institute, Helsinki, Finland (FMI), [7]GFZ German Research Centre For Geosciences, Potsdam, Germany (GFZ)

EPOS EUROPEANPLATEOBSERVINGSYSTEM

The EPOS SP project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 871121

Geo-electromagnetic data

***EGMODA** (European Geomagnetic Model and Data Archive)*	***ESGI** (European Service of Geomagnetic Indices)*	***EMTDAMO** (European Service of Magnetotelluric Data and Models)*
• ***Existing services:*** INTERMAGNET, WDC for geomagnetism Edinburgh, IMAGE • ***Existing international efforts:*** *main and crustal field modelling under IAGA auspices (*IGRF, WDMAM,…)	• ***Based on existing services:*** ISGI and ISGI-Collaborating Institutes: Service on Rapid Magnetic Variations (Ebro Obs.), Kp service; IMAGE	• ***Developed during EPOS implementation phase***

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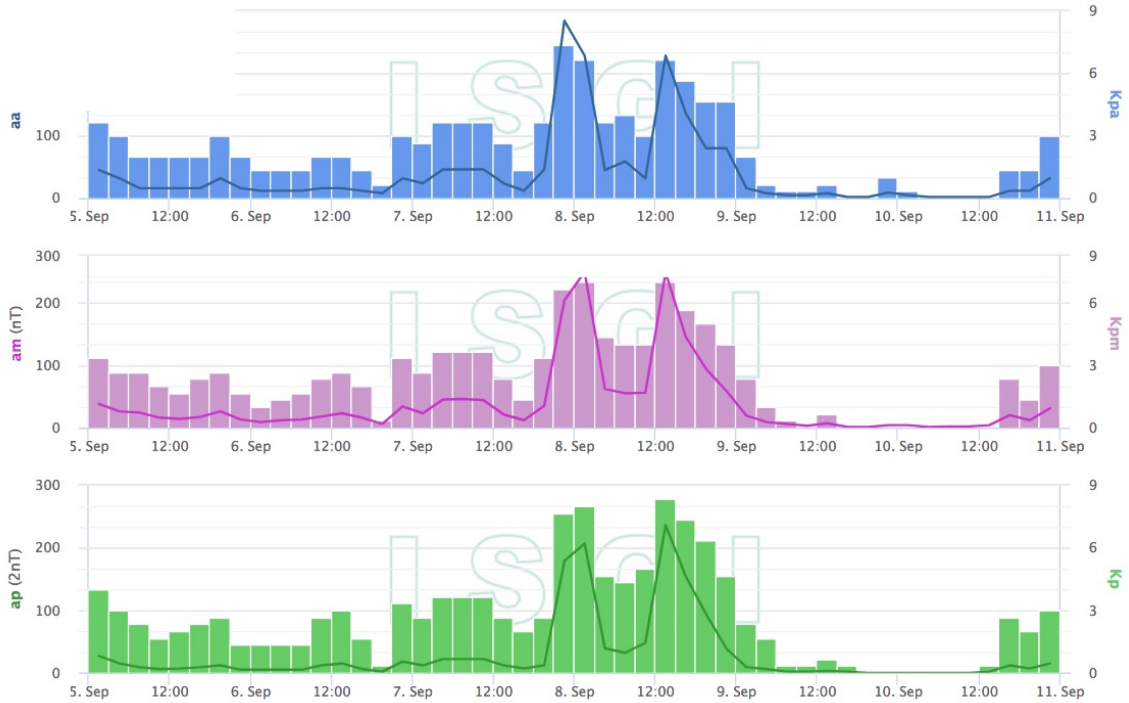
GEOMAGNETIC OBSERVATIONS

EGMODA

The **European Geomagnetic and Model Archive** provides users, ranging from academics to the public, with a single entry point to a wealth of geomagnetic data and models from around the world. These data and models are currently held in a variety of formats, software and locations. EGMODA makes all these impediments to access and exploitation invisible and irrelevant to potential users, opening up cross-disciplinary possibilities for scientists and others.

ESGI

The **European Service of Geomagnetic Indices** will provide users direct access to data and data-products as geomagnetic activity indices and lists of remarkable events. Internationally distributed institutes currently derive these data products.



Evolution of three planetary sub-auroral geomagnetic indices during the geomagnetic storm of 8-9 September 2017, from top to bottom: *aa* and *am* (derived by EOST-Strasbourg university, France- under the licence CC:BY-NC 4.0), and *Kp* (derived by GFZ Potsdam - Germany- under the licence CC:BY 4.0). Copyright: ISGI Web site (http://isgi.unistra.fr) licence CC:BY 4.0.

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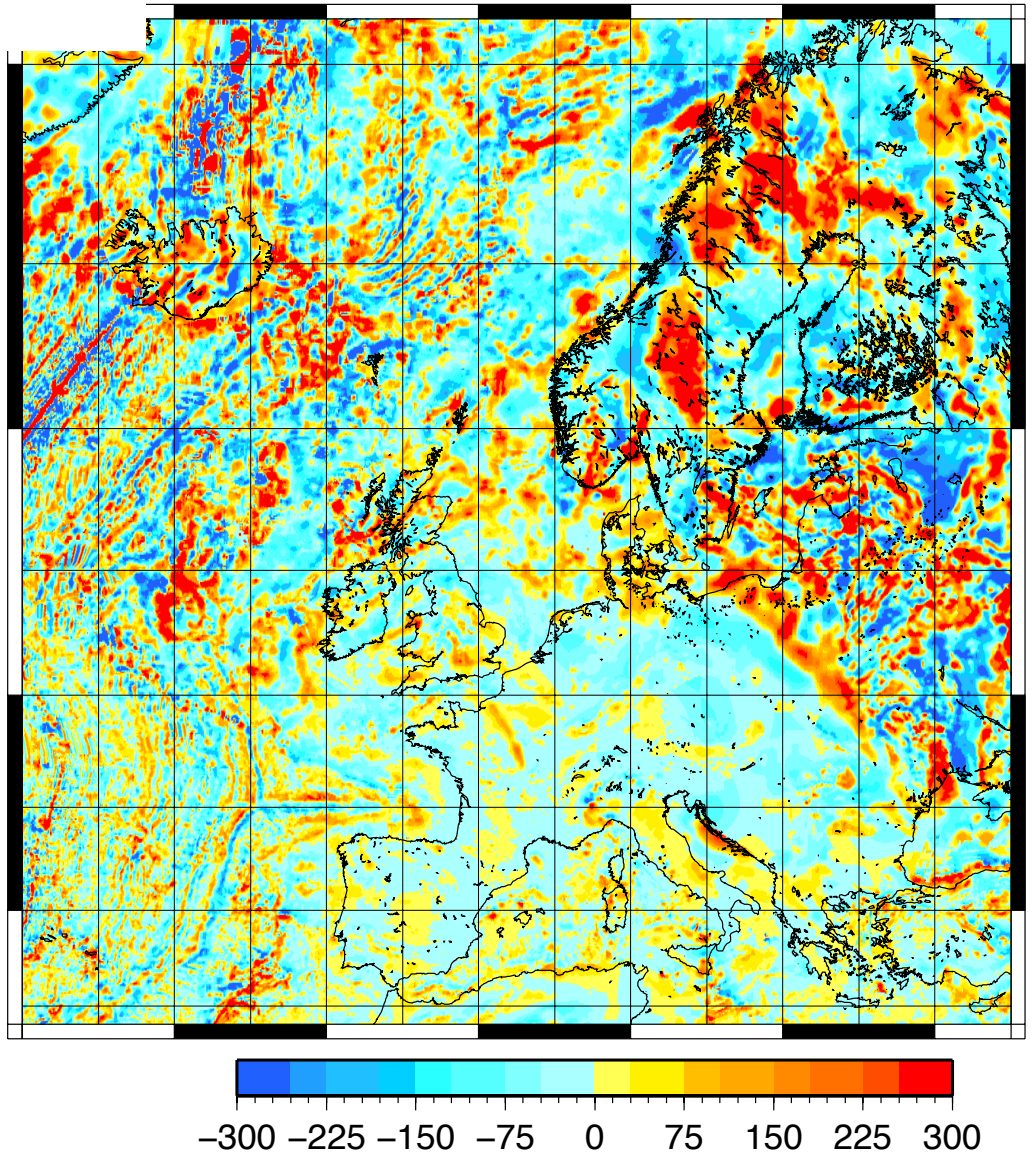
WDMAM

Magnetic Anomaly Map over Europe, sample of the World Digital Magnetic Anomaly Map international effort (http://www.wdmam.org/)



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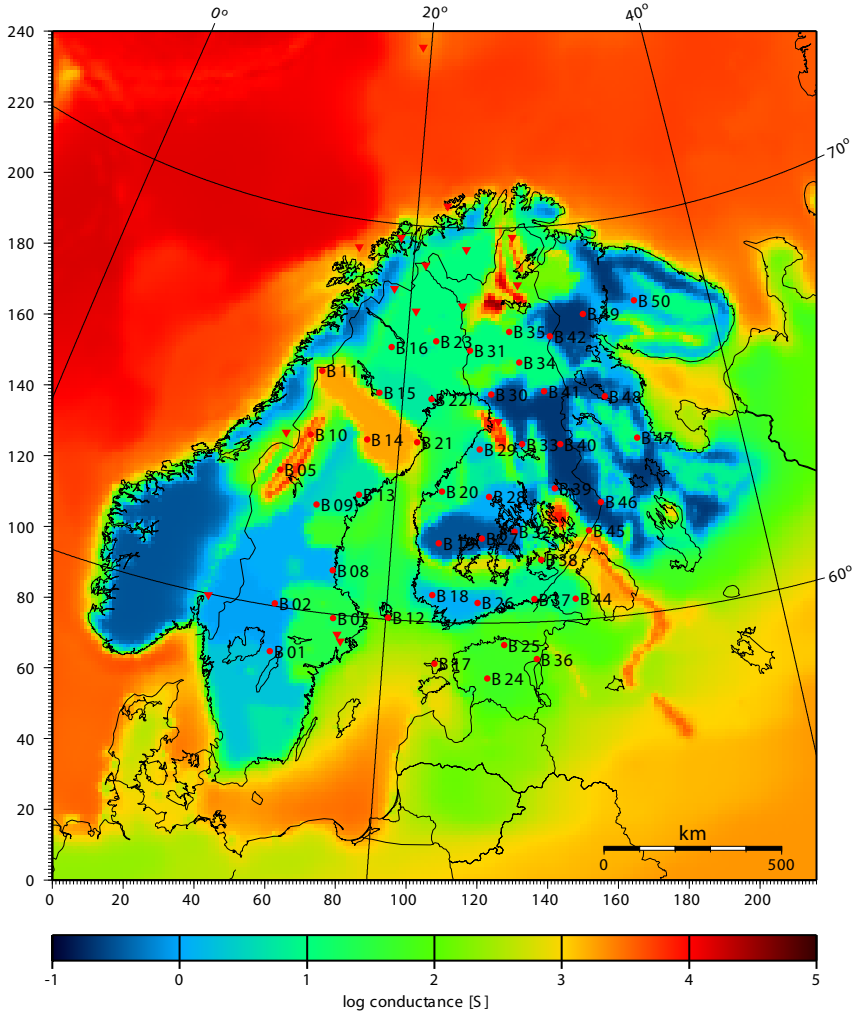

Figure 3: *Conductance map of the upper crust (0-10 km) including seawater and sediments.*

EMTDAMO

The service for Magnetotelluric Data and Models is developed in close contact with its user community in IAGA Division VI: Electromagnetic Induction in the Earth and Planetary Bodies. Use case scenario include, for instance, better understanding of geomagnetically induced currents (GIC) effects, which affects society as a whole, would benefit from the possibility to exchange seamlessly the data between space and earth observations, including time series and models.

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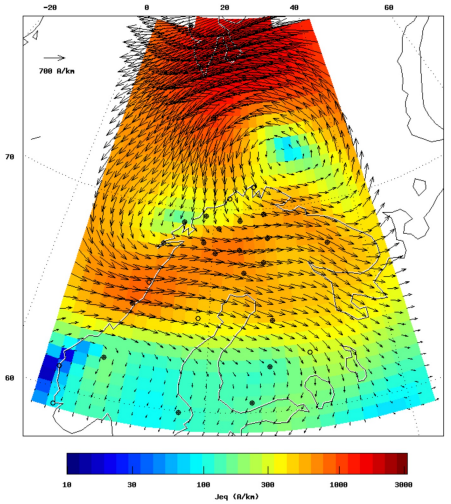
Accurate GIC estimation on regional scale

Require both detailed 3D conductivity model and realistic source current system, i.e. geomagnetic data.
Gridded electric field at the Earth's surface can then be accurately estimated and enter into estimation of GIC currents.

Equivalent current system



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3D conductivity model

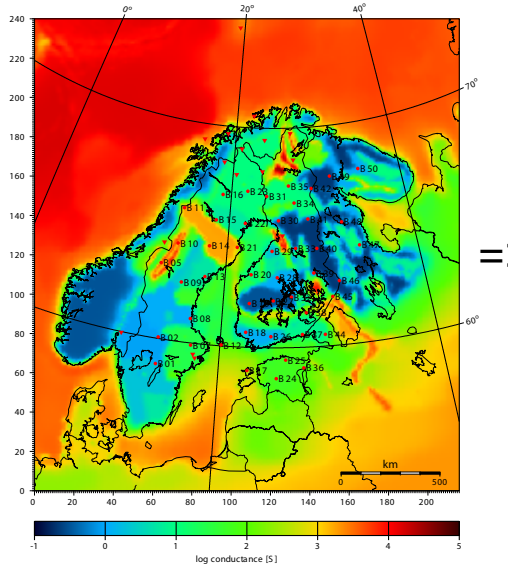

Figure 3: *Conductance map of the upper crust (0-10 km) including seawater and sediments.*

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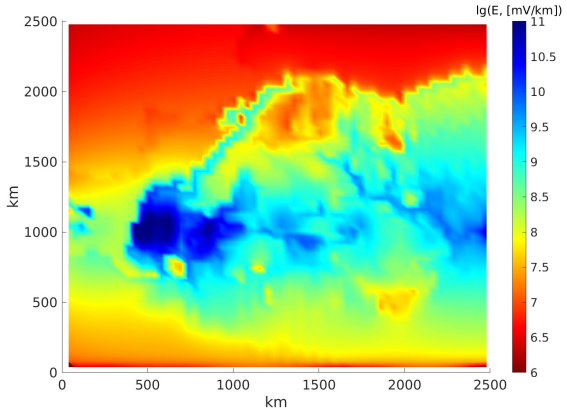
Map of gridded geolectric fields



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Why do we need metadata standard

We won't always be around to explain our work in person.

Are we doing as good a job to record our work in the digital age as was done by observatories creating year books?

Common exchange format for observatory data and magnetotelluric data were developed.

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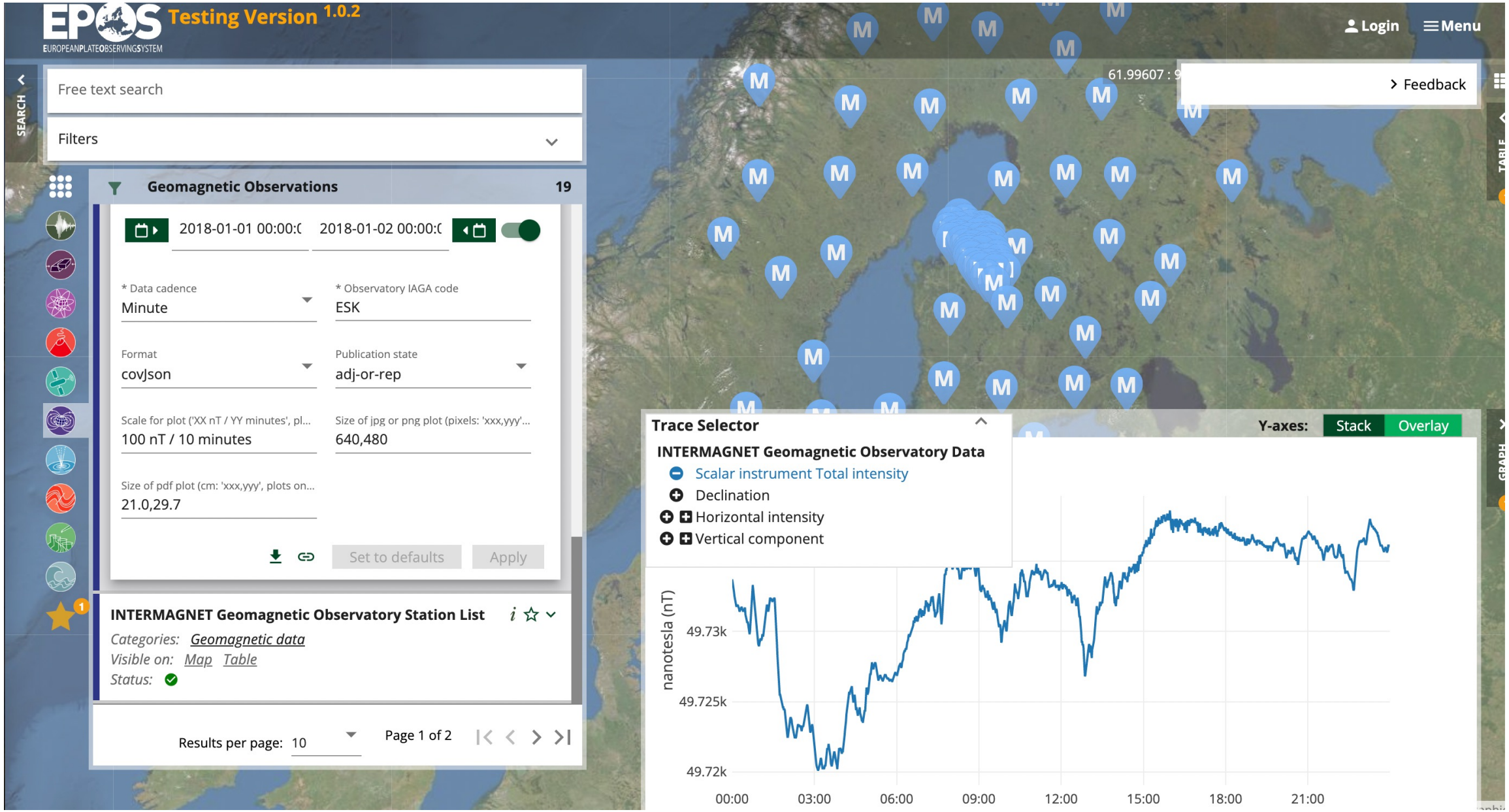

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To be continued…

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