



ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE

Space weather activities in Finland

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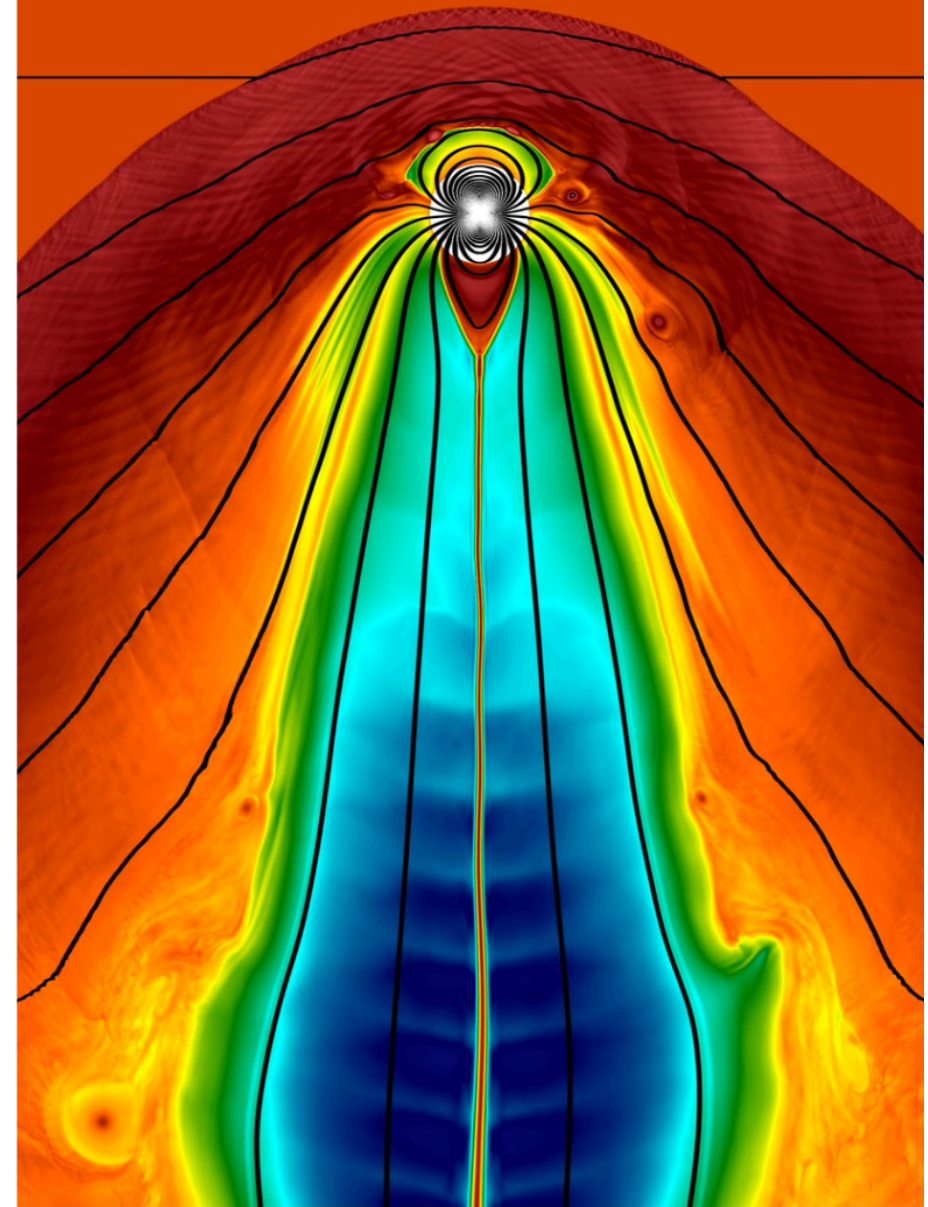
PECASUS (pecasus.eu)

Partnership of Excellence for Civil Aviation Space weather User Services

- Space weather monitoring for global civil aviation (ICAO)
- Led by Finnish Meteorological Institute (FMI)
 - DLR, FU, INGV, KNMI, SANSA, SL, SRC, STCE, UKMO
- One of 4 centers taking 2 week shifts for 24/7 operation
- Advisory types: High-Frequency COMmunication, GNSS-based navigation, increased RADIATION dose (FL250-600)
- Operations started in 2019

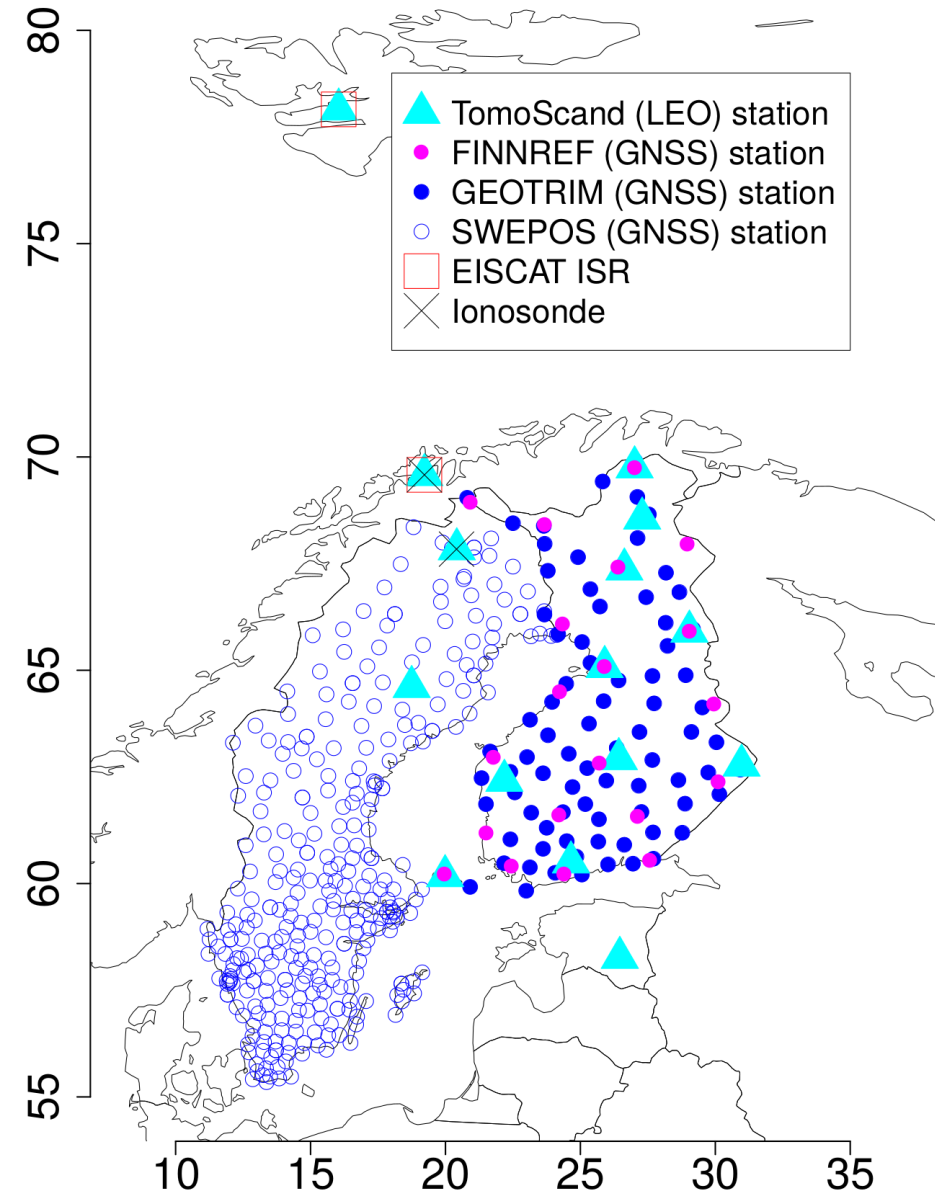
Vlasiator (physics.helsinki.fi/vlasiator)

- Ion-kinetic modeling of Earth's magnetosphere in 2D (+vx,vy,vz)
 - 3D & ionosphere under development
- Massively more computationally demanding than MHD
- Impossible physics for MHD
- Free software: github.com/fmihpc/vlasiator
- Project currently at [UH.fi](https://uh.fi), previously at FMI



TomoScand

- 3D reconstruction of ionospheric electron density
- Multi-instrument ionospheric tomography
- Can utilize any electron density-related measurement
 - GNSS, ionosonde, etc
- Joint project of [FMI.fi](https://www.fmi.fi) and [SGO.fi](https://www.sgo.fi)



Some new SW projects in Finland

- Ionospheric situational awareness: [HISSA](#), [ISAw](#)
- Eur incorherent scatter radar 3D: [KAIRA](#)
- [Lapland satellite 1](#)
- [IMAGE](#) mag network expanded to Poland and Germany
- [GUMICS](#): [22 year simulation](#) of Earth's magnetosphere

