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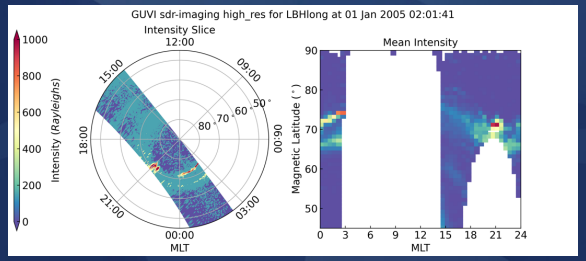
pyIntensityFeatures

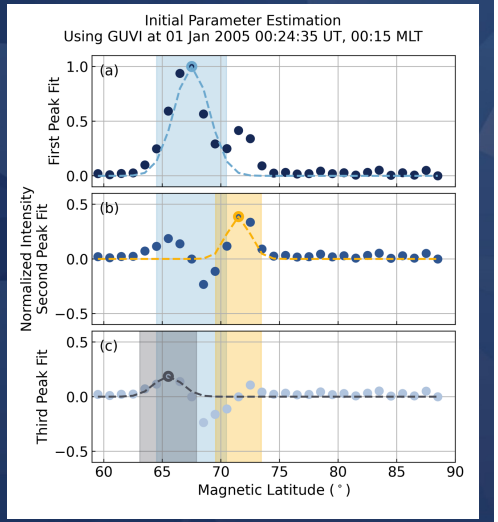
Identify features, such as auroral luminosity boundaries, in imager data

(1) Provide slice with aurora

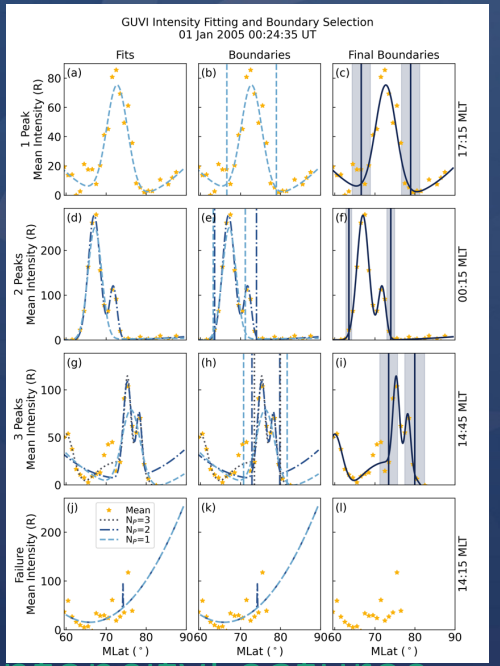


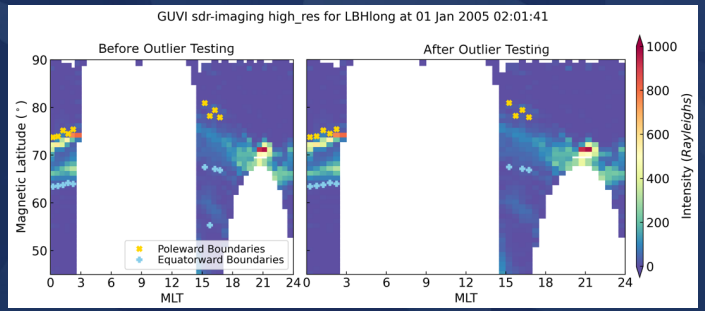
(2) Get gridded mean intensity

(3) Initialize fitting for multi-peaked Gaussian with quadratic background



(4) Identify best boundaries





(5) Remove outliers

(6) Boundaries!

pyIntensityFeatures https://github.com/aburrell/pyIntensityFeatures

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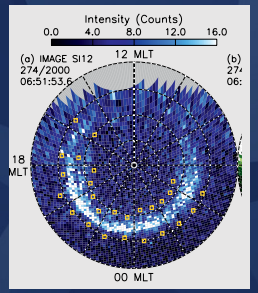
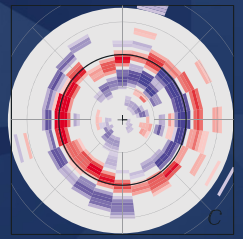
OCBpy

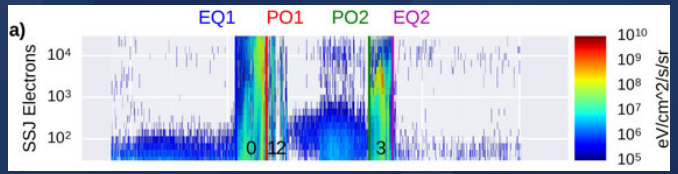
Convert between geodetic or magnetic and adaptive, polar boundary coordinates

Provides Observed Boundaries

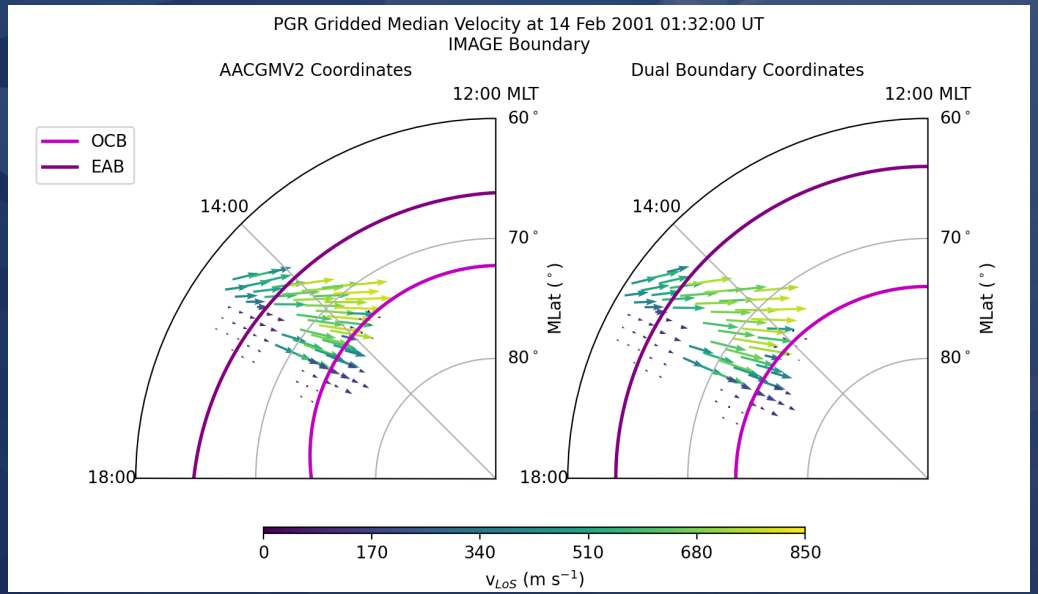
IMAGE, DMSP, AMPERE







Locate and Scale Data



OCBpy: https://github.com/aburrell/ocbpy

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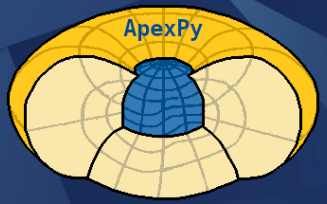

Convert between geodetic and modified apex or quasi-dipole apex magnetic coordinates

- Python wrapper for the Apex fortran library (Emmert et al., 2010)
  - Converts between geodetic, modified apex, and quasi-dipole coordinates
  - Obtains the modified apex and quasi-dipole base vectors (Richmond, 1995)
  - Uses the geodetic system WGS-84
  - Also calculates magnetic local time, magnetic inclination, converts between geocentric and geodetic latitudes, and finds the subsolar location
- ApexPy requires a local FORTRAN compiler, which needs to be installed and useable before attempting installation

ApexPy: https://github.com/aburrell/apexpy

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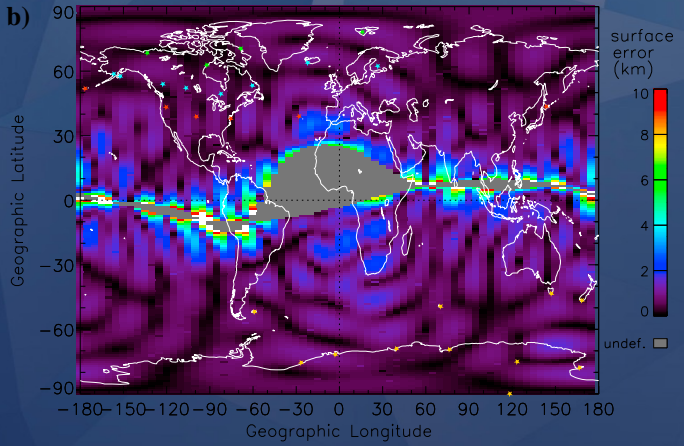
Convert between geodetic, geocentric, and altitude-adjusted corrected geomagnetic magnetic coordinates

Shepherd 2014, Figure 5b



- Python wrapper for the AACGM-V2 library (Shepherd, 2014)
  - Converts between geodetic/centric locations and magnetic latitude, longitude, and local time
  - Designed to be used at high altitudes in the ionosphere
    - Tracing can be done into lower magnetospheric altitudes
    - Is undefined at some regions near the magnetic equator
  - Also calculates dipole title, subsolar point, and converts between geocentric and geodetic latitudes

- AACGMV2 wraps C-code, and so requires a compiler before installation
- AACGMV2 uses environment variables to find important files
  - The Python package will use existing environment variables of the same name
  - If they don't exist, the Python code will set them (may be an issue in Powershell)
- Includes pre-IGRF magnetic coordinates (starting in 1590 C.E.)

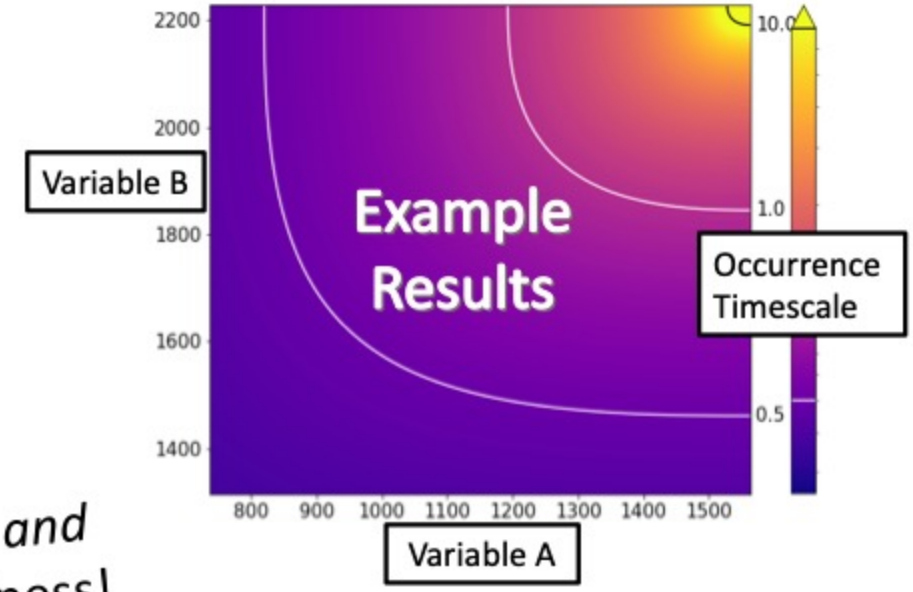
aacgmv2: https://github.com/aburrell/aacgmv2

Bivariate Extreme Value Analysis on Generic Data

Do you have two long-ish timeseries?

Do you think they are coupled/correlated in some way?

Use our python package to analyse the *joint extremal behaviour* of your two variables!



Can be used for science *and* space weather preparedness!

github.com/arfogg/bi_multi_variate_eva

Alexandra Ruth Fogg
arfogg@cp.dias.ie
Dublin Institute for Advanced Studies, Ireland

magcoordmap

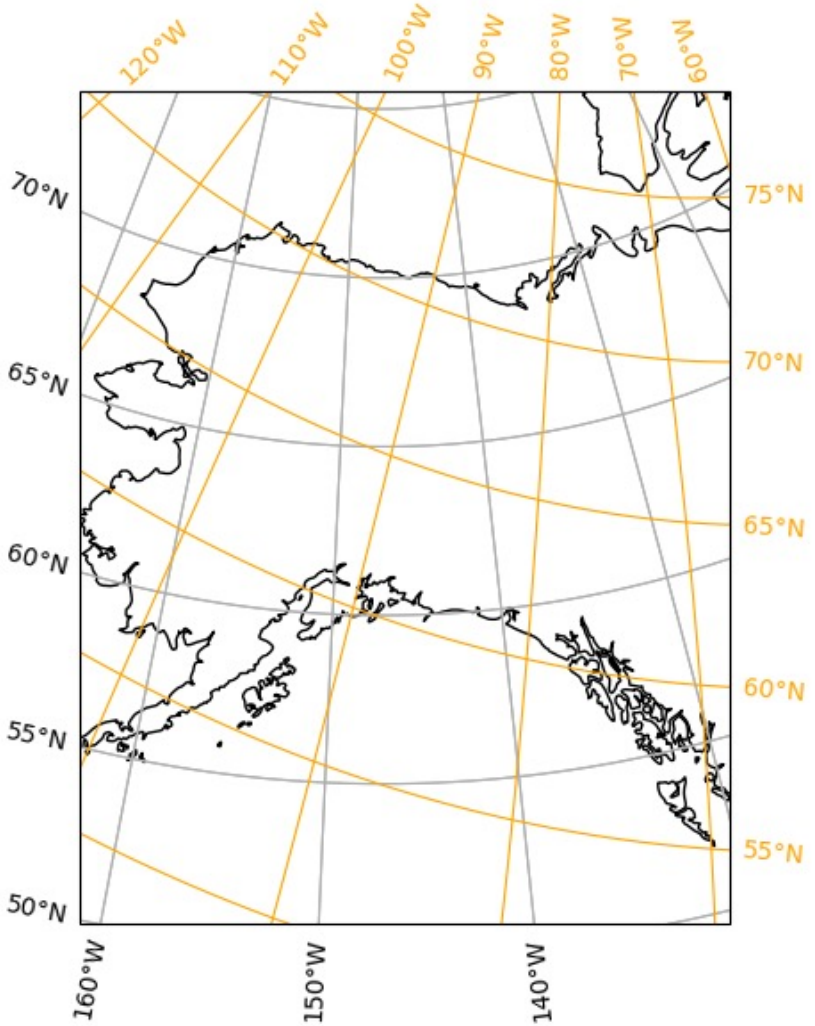
- Automatically add a grid of Apex magnetic coordinates to a cartopy map
- Uses cartopy's gridline interface to set grid lines and adjust them manually
- Gridline properties can be adjusted with cartopy keywords

Contact: Leslie Lamarche – leslie.lamarche@sri.com

GitHub: https://github.com/ljlamarche/magcoordmap

PyPI: https://pypi.org/project/magcoordmap/

Funding Support: NSF Grant 2027300, NSF Grant 2329981, NASA Grant 80NSSC21K0458, NASA Grant 80NSSC21K1354, NASA Grant 80NSSC21K1318



amisrsynthdata

- Create synthetic data files for the Advanced Modular Incoherent Scatter Radars (AMISRs)
- Specify both radar configuration and ionospheric state
- Generating “truth” reference data and determining what certain phenomena would look like in AMISR data

Contact: Leslie Lamarche - leslie.lamarche@sri.com

GitHub: https://github.com/amisr/amisrsynthdata

PyPI: https://pypi.org/project/amisrsynthdata/

Funding Support: NSF Grant 2329981, NASA Grant 80NSSC21K0458