

# FIRST RESULTS FROM A NETWORK OF GPS SCINTILLATION RECEIVERS IN THE ANTARCTIC

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GWSWF MODENA MEETING 11-12 APRIL 2011



**British  
Antarctic Survey**

NATIONAL ENVIRONMENT RESEARCH COUNCIL



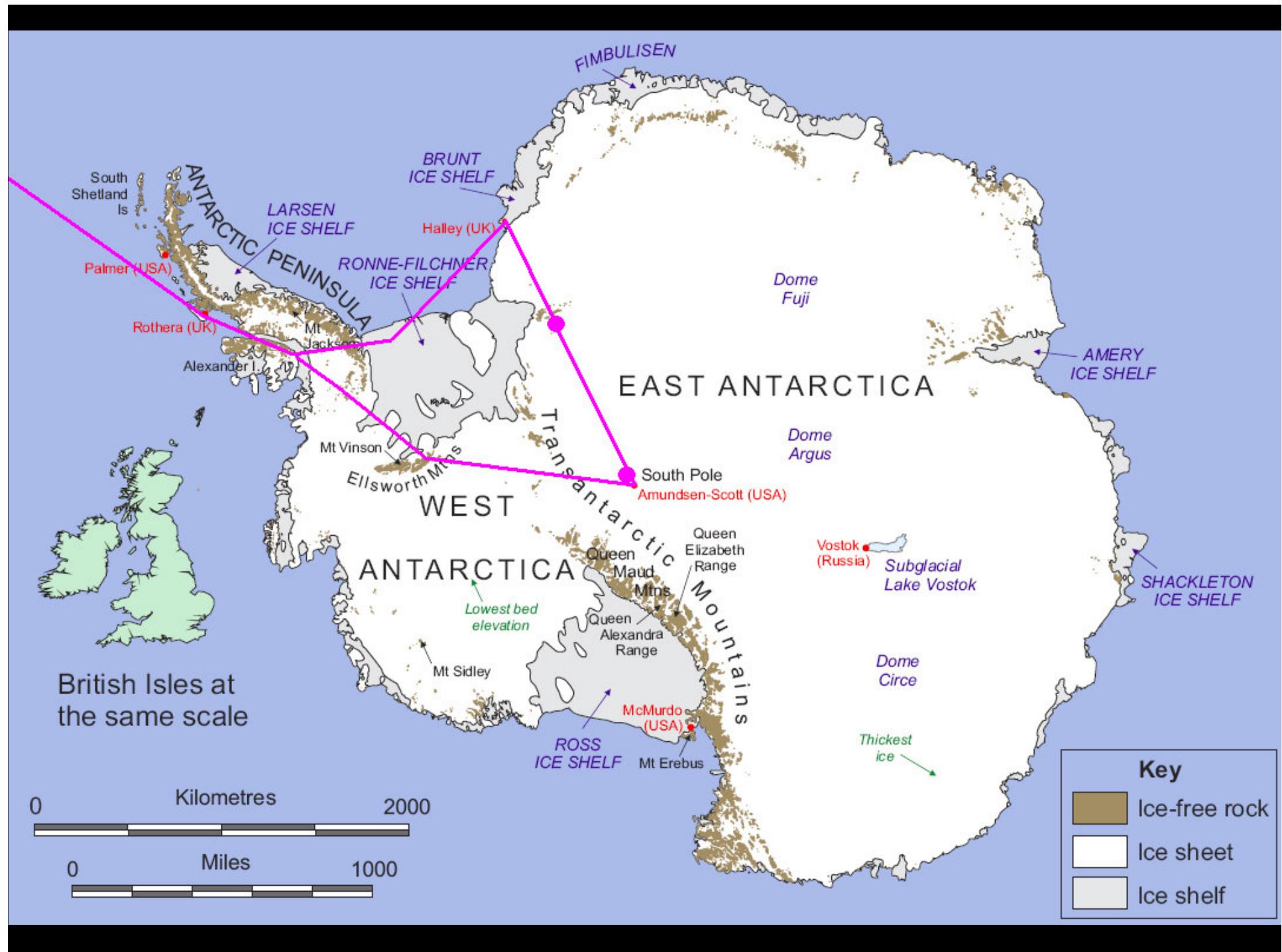
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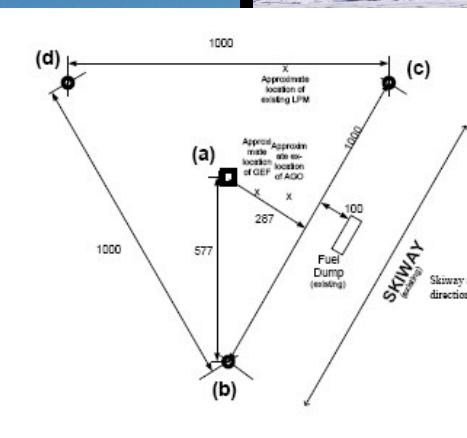
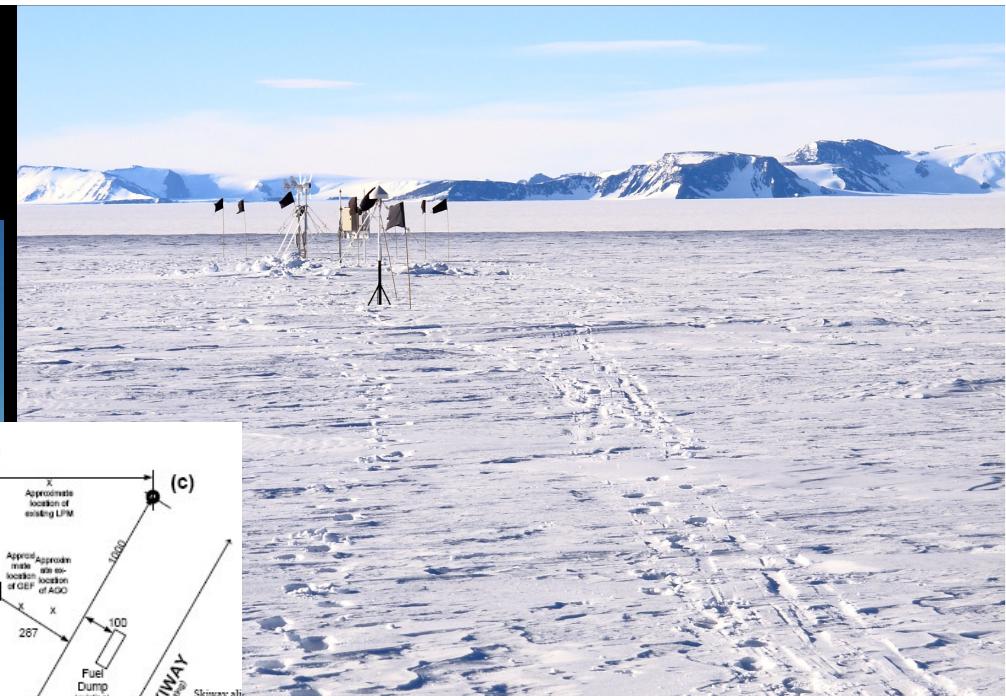


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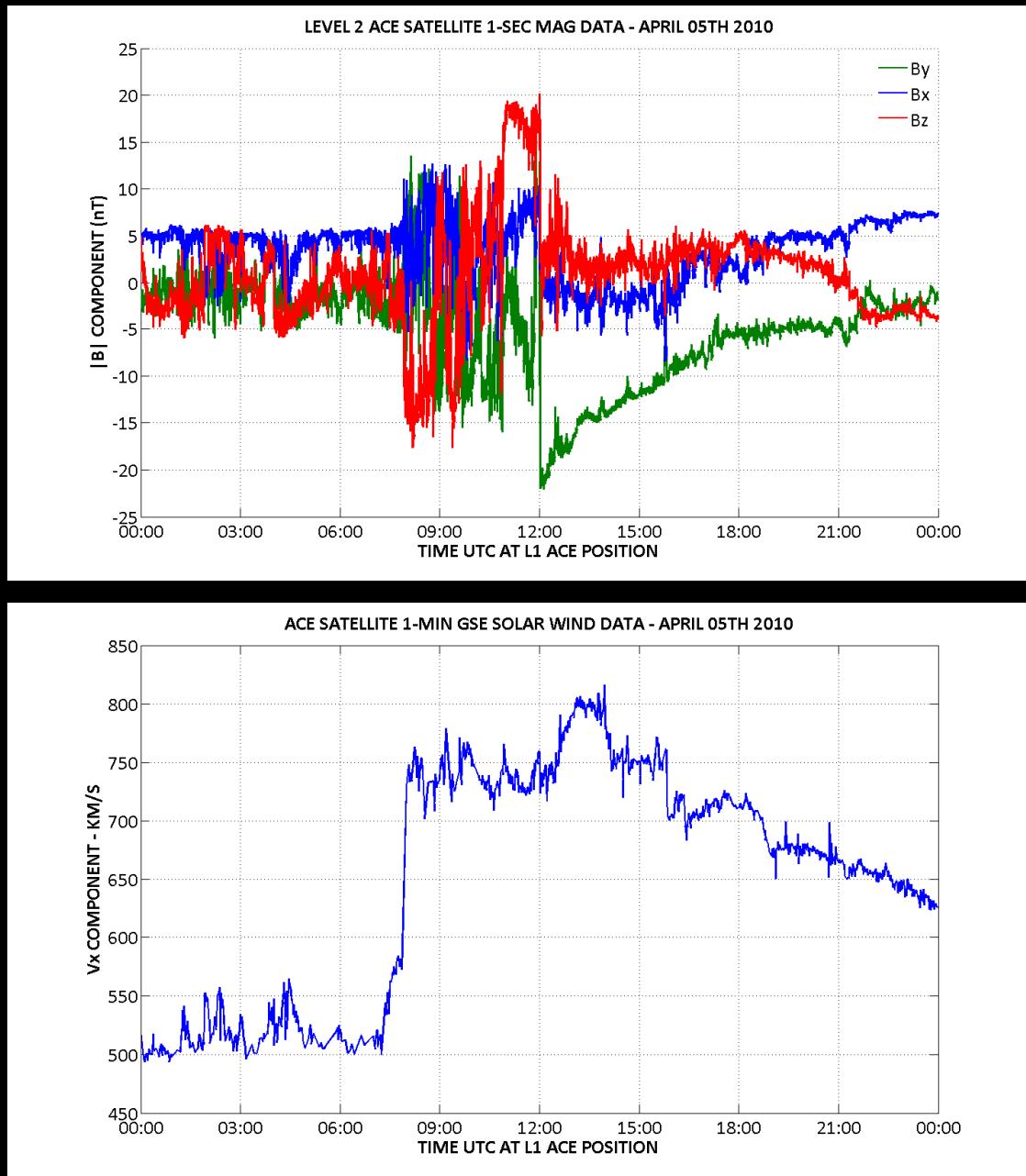




# Case Study – 05<sup>th</sup> and 06<sup>th</sup> April 2010

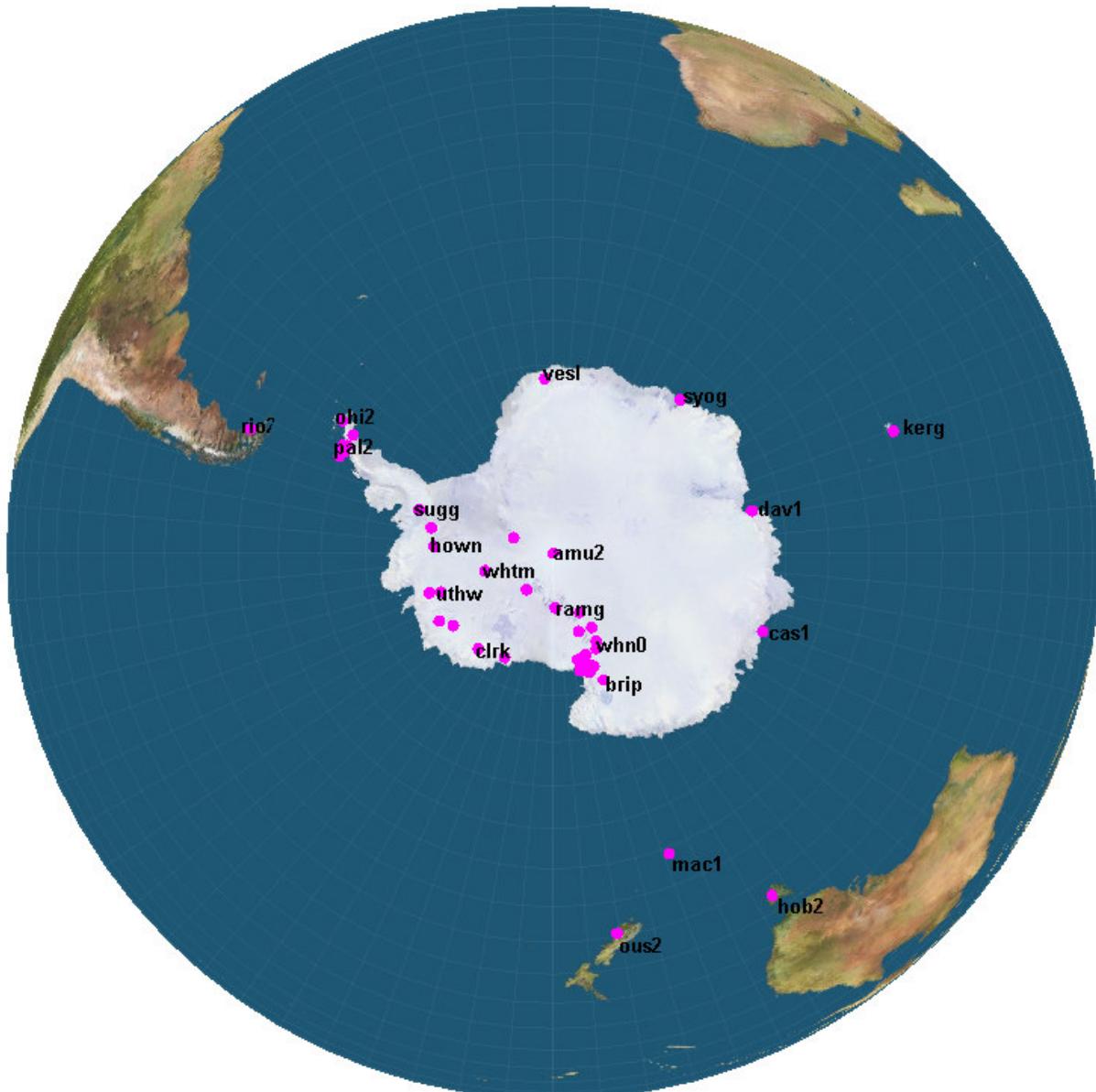
Three aspects:

- 1) Ionospheric TEC imaging by inversion tomography (MIDAS).
- 2) Superposition of scintillation indices in an effort to discover any temporal and spatial correlation with plasma structuring.
- 3) Ionospheric specification for satellite-based P-Band SAR applications.



ACE level 2 magnetometer data provided by the ACE SWEPAM instrument team and the ACE Science Centre. ACE solar wind velocity data obtained from the Space Physics Interactive Data Resource (SPIDR) of NOAA.

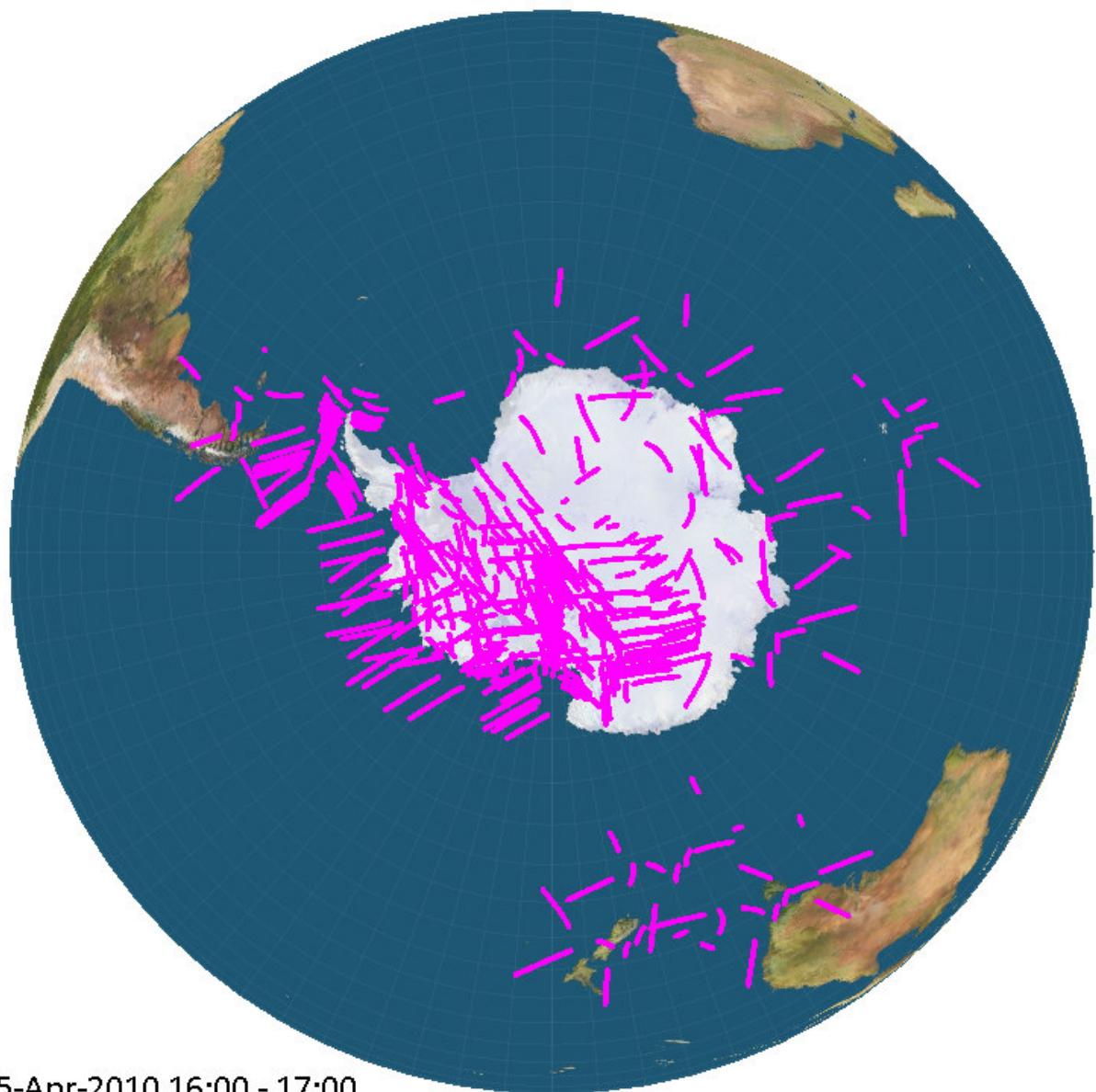
# Dual Frequency GPS Receiver Coverage – April 2010

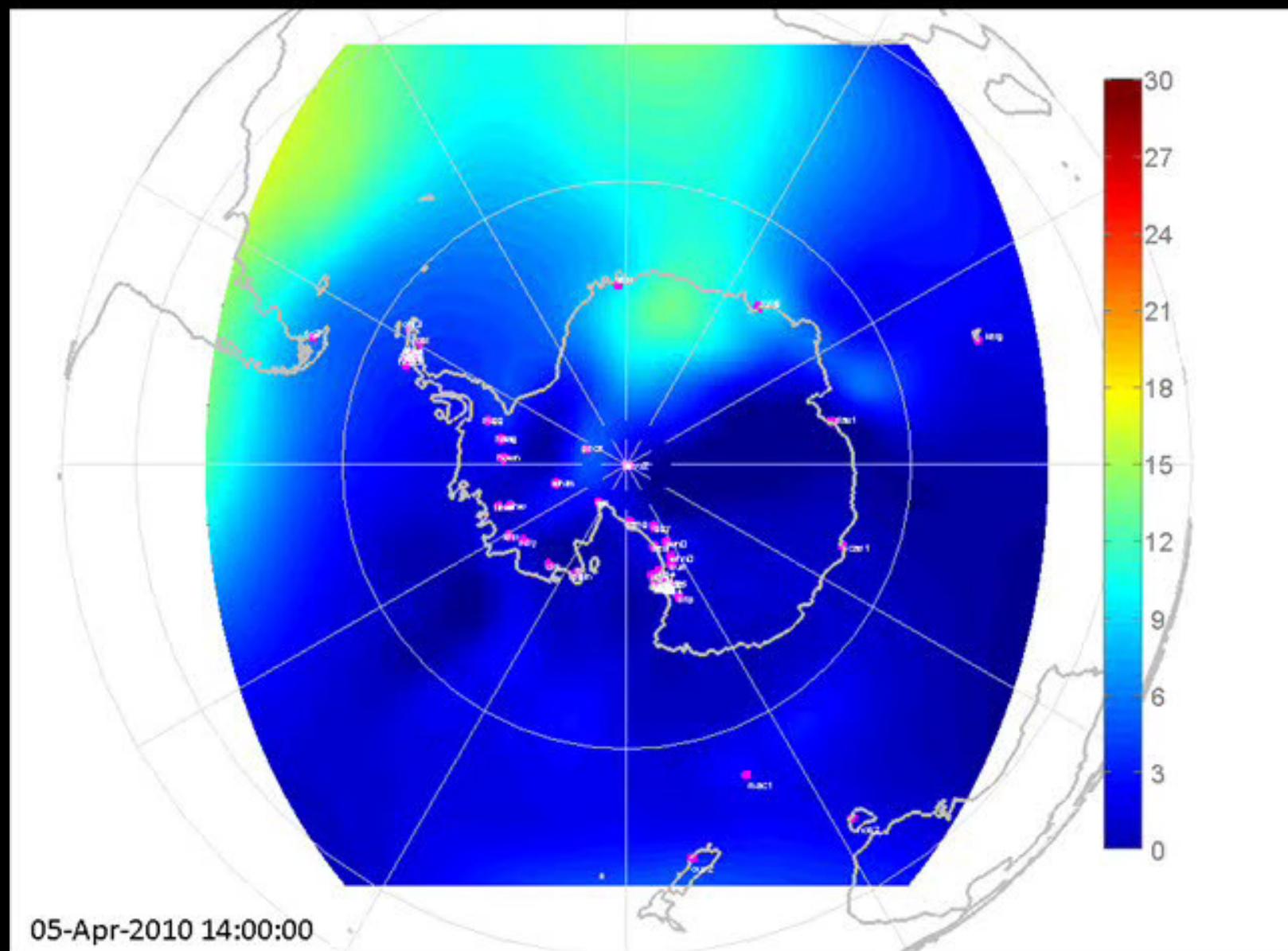


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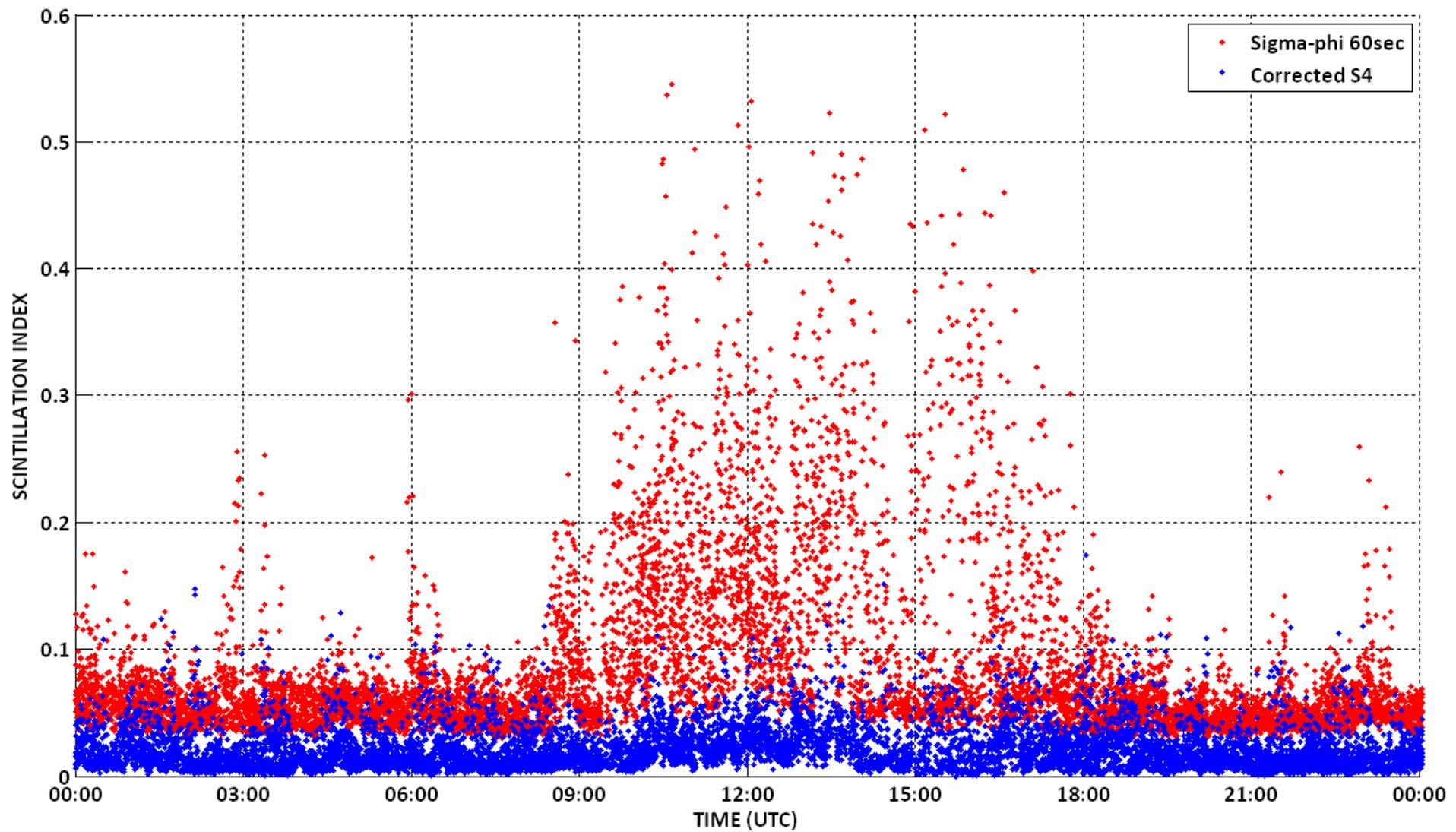
*This material is based on data services provided by the UNAVCO Facility with support from the National Science Foundation (NSF) and National Aeronautics and Space Administration (NASA) under NSF Cooperative Agreement No. EAR-0735156.*

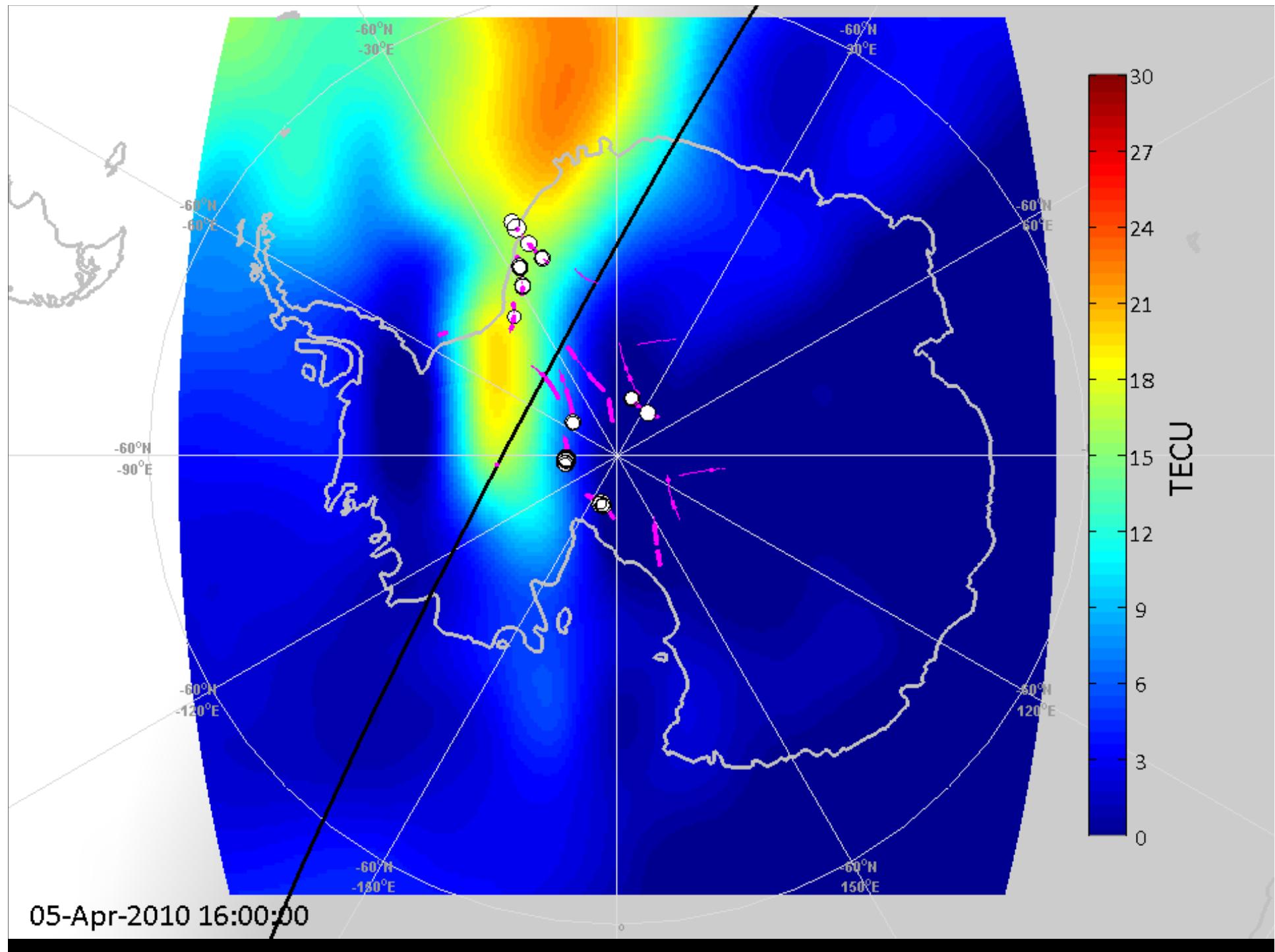
# Raypath Coverage for Inversion Imaging

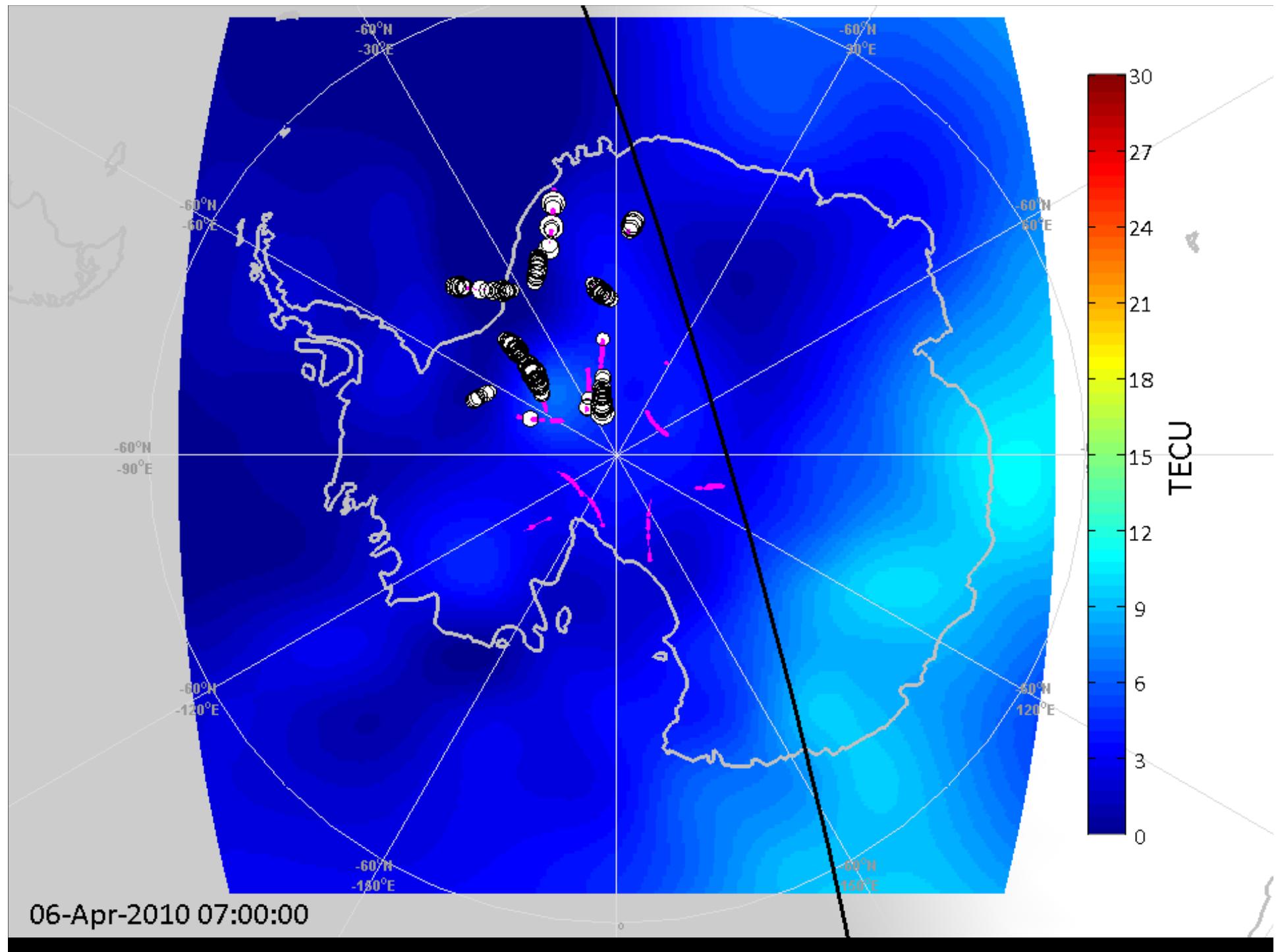




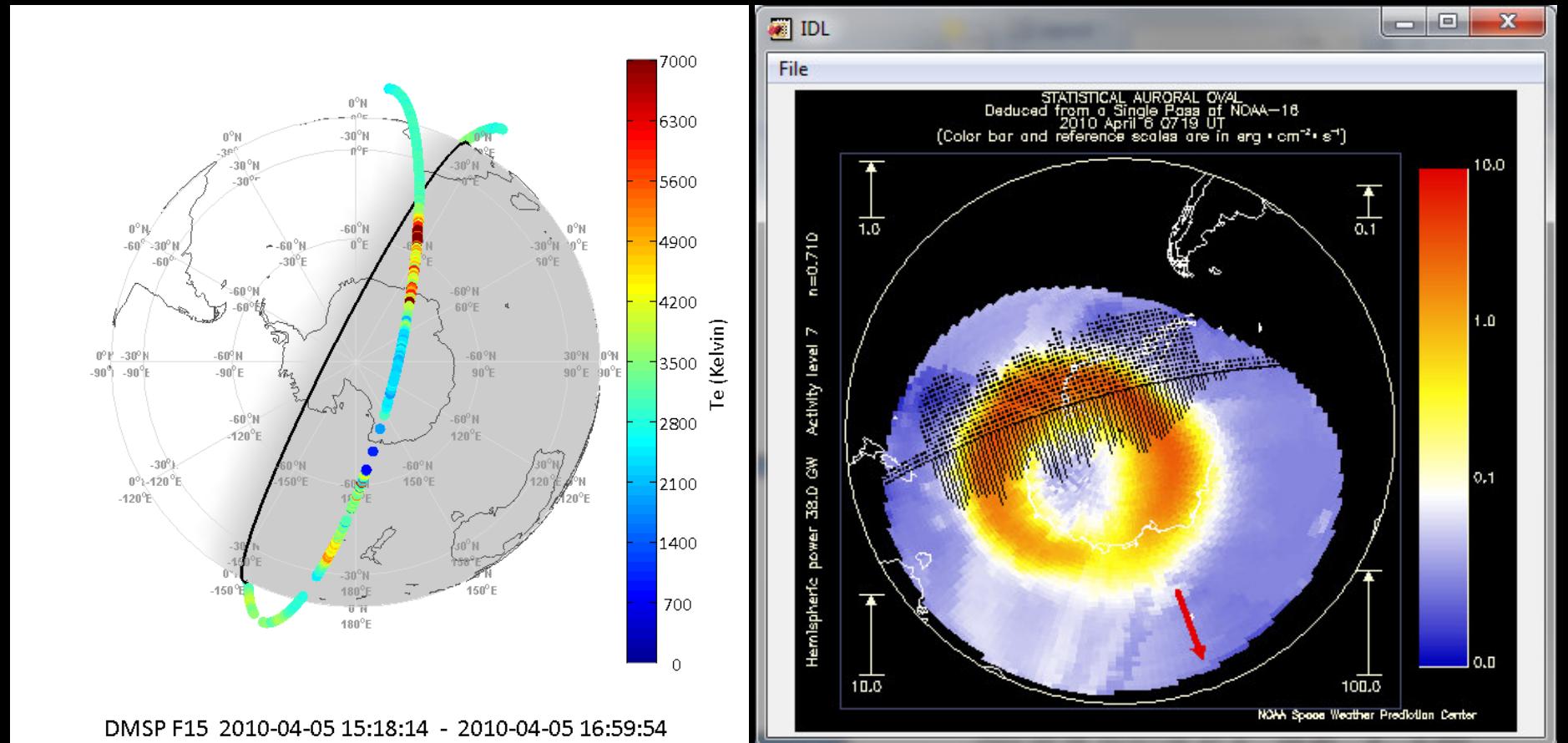
SOUTH POLE STATION - ALL OBSERVED GPS SATELLITE L1 SCINTILLATION INDICES DURING APRIL 05TH 2010







# Verifying Images – Multi-instrument Approach



DMSP thermal plasma data provided by the Centre for Space Sciences at the University of Dallas at Texas and the US Air Force. POES statistical auroral images provided by the Space Weather prediction Centre (SWPC) of NOAA.

## Summary

- Network of remote GPS scintillation receivers now in second Antarctic season of operation.
- Obtaining data during the dark winter season is an engineering challenge.
- Plasma structure imaged during a geomagnetic disturbance during April 05<sup>th</sup> 2010.
- Phase scintillation observed over a two day period following the geomagnetic disturbance, possibly due to night-time return flow or auroral precipitation.



Questions?