Jet Propulsion Laboratory
California Institute of Technology

A Review on the Application of High Resolution SSTs in a Coastal Upwelling Region: The test case off Peru

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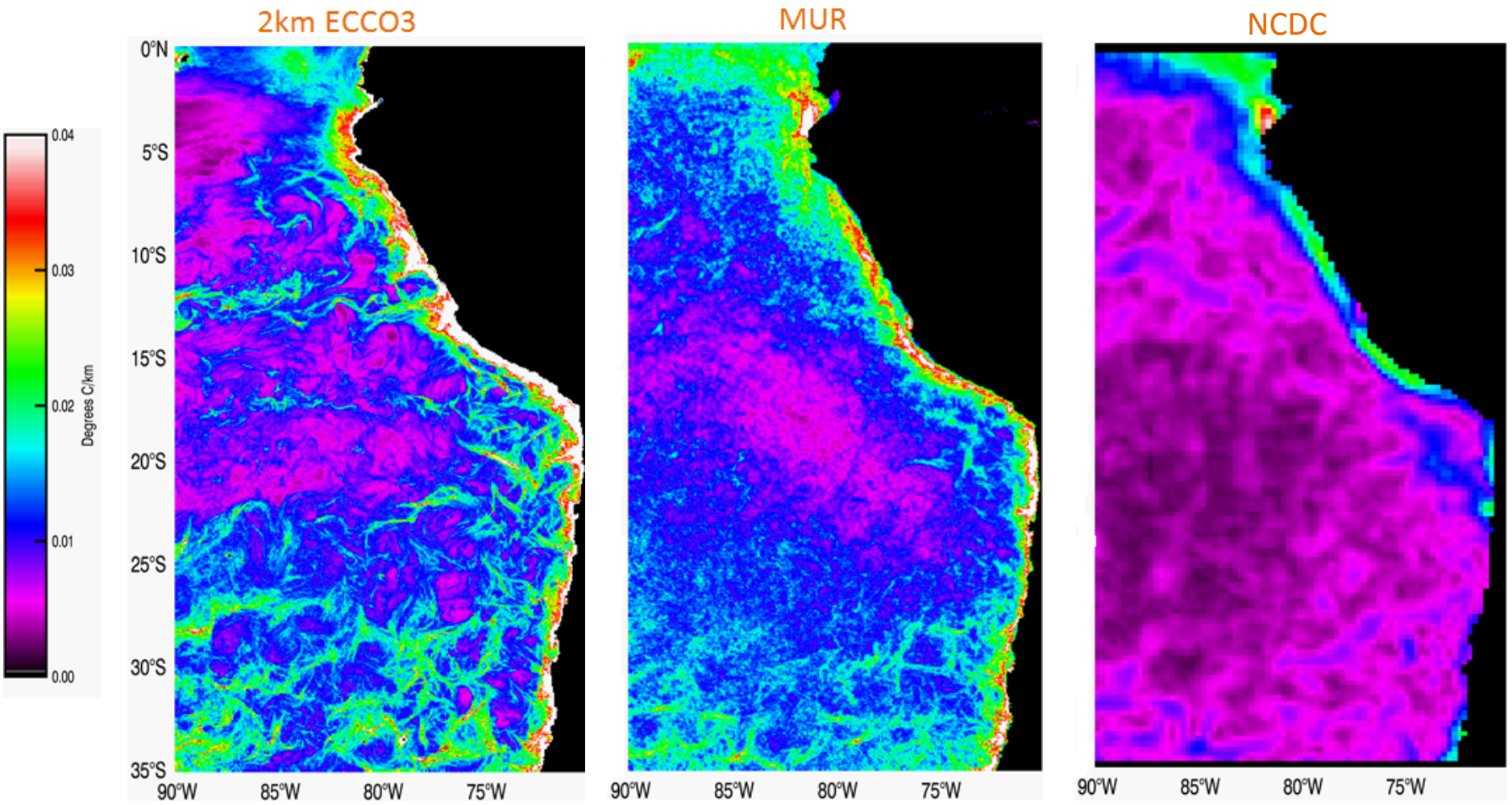
[1]Jorge Vazquez-Cuervo,, [1]Toshio M. Chin
[1]Edward Armstrong

Jet Propulsion Laboratory/California Institute of Technology, Pasadena, USA

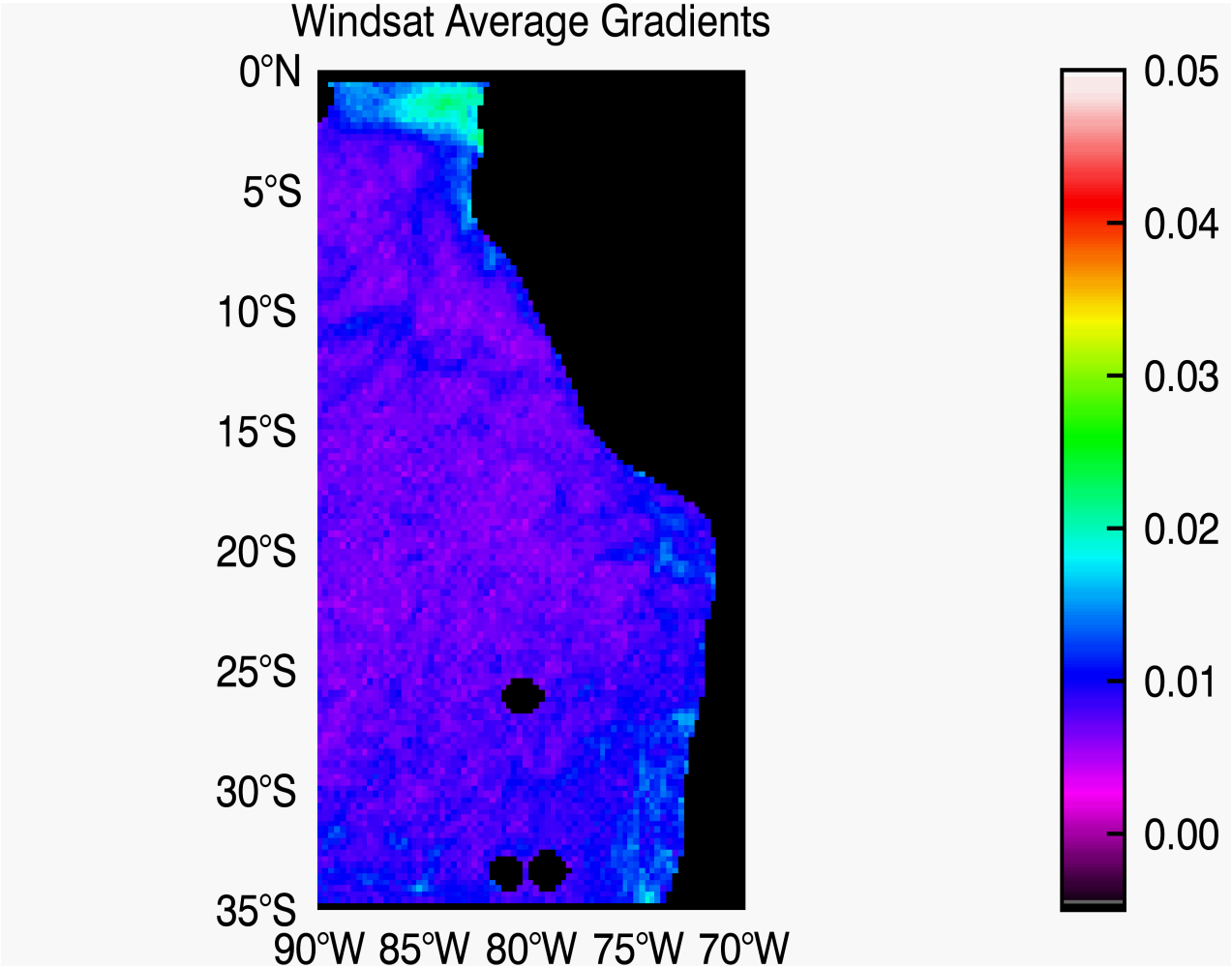
Methodology

- **SST gradients from Oct-Nov 2011 were calculated in an area off the South American Coast between 35S to 0S and 90W to 70W.**
- **Covariability modes of the magnitude of SST gradients were calculated between a high resolution run of the (2km) Estimating the Circulation and Climate of the Ocean (ECCO2) model and gradients derived from the 1km gridded Multi-Scale Resolution Sea Surface Temperature Data (MUR) set and the 0.25 degree National Climatic Data Center (NCDC) SST data.**
- **Longitude sections of SST gradients at 18S and 30S were calculated to identify possible upwelling scales.**

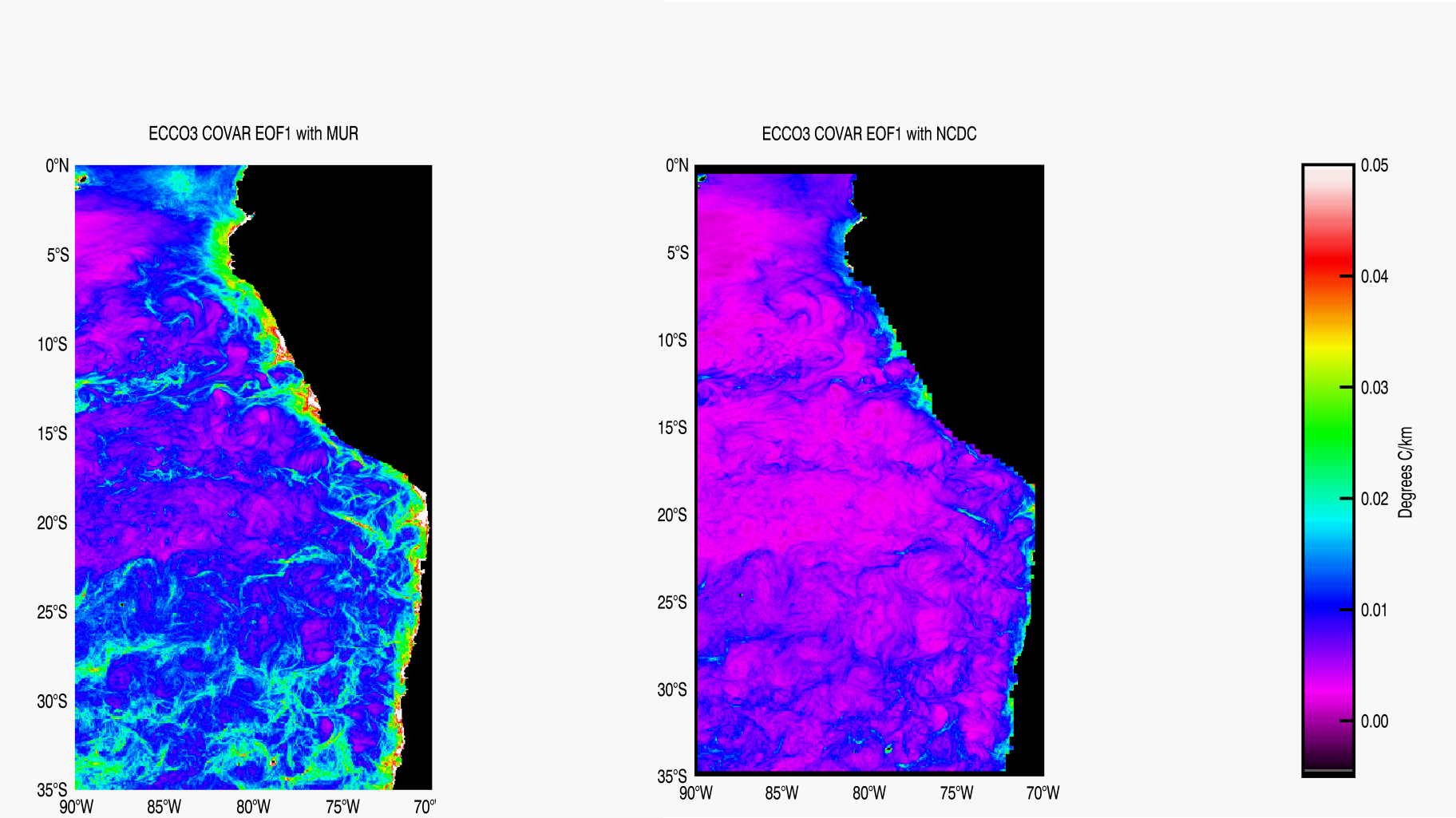
Comparison of Mean SST Gradient Magnitudes derived from 2km ECCO2, MUR and NCDC for a 2-month period (Oct-Nov 2011)



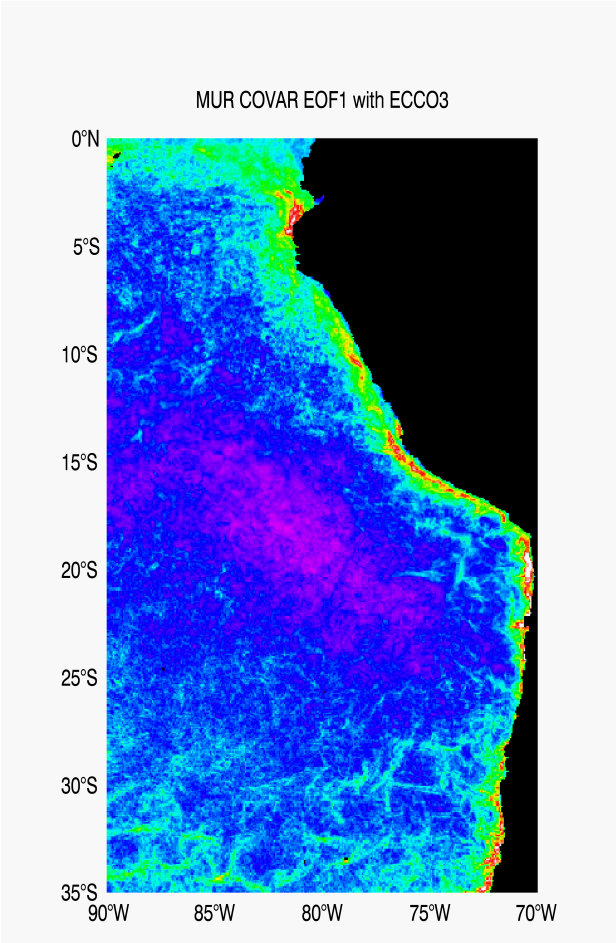
Windsat Derived Mean SST Gradient Magnitudes Oct-Nov 2011

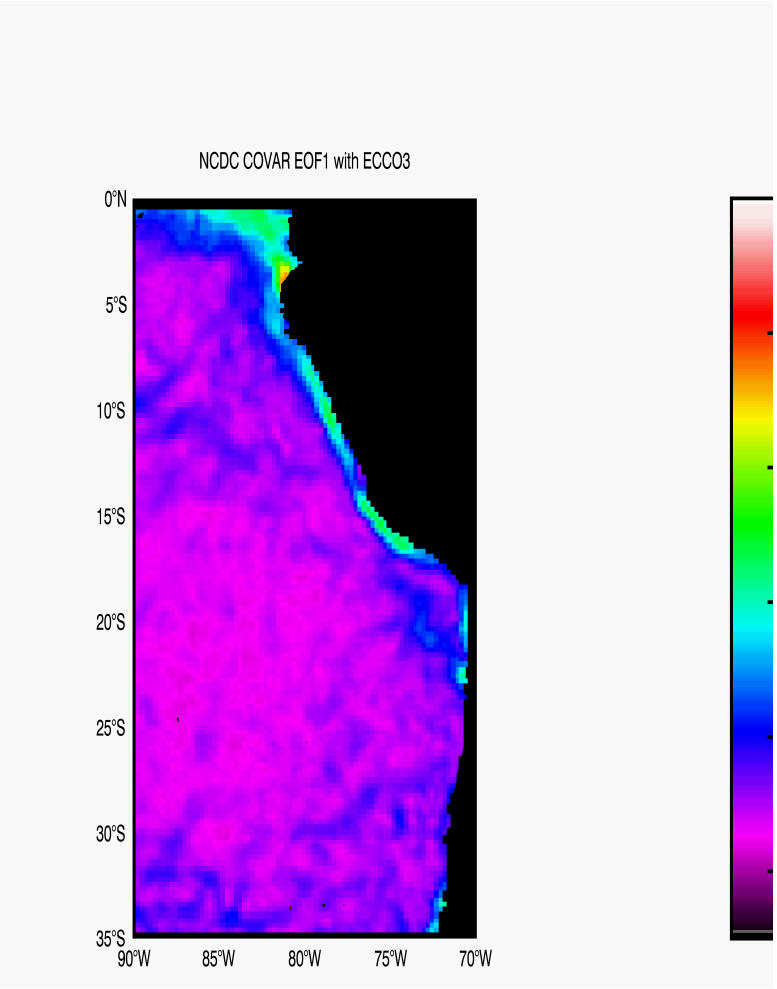


Covariability ECCO2 MUR and NCDC Mode 1

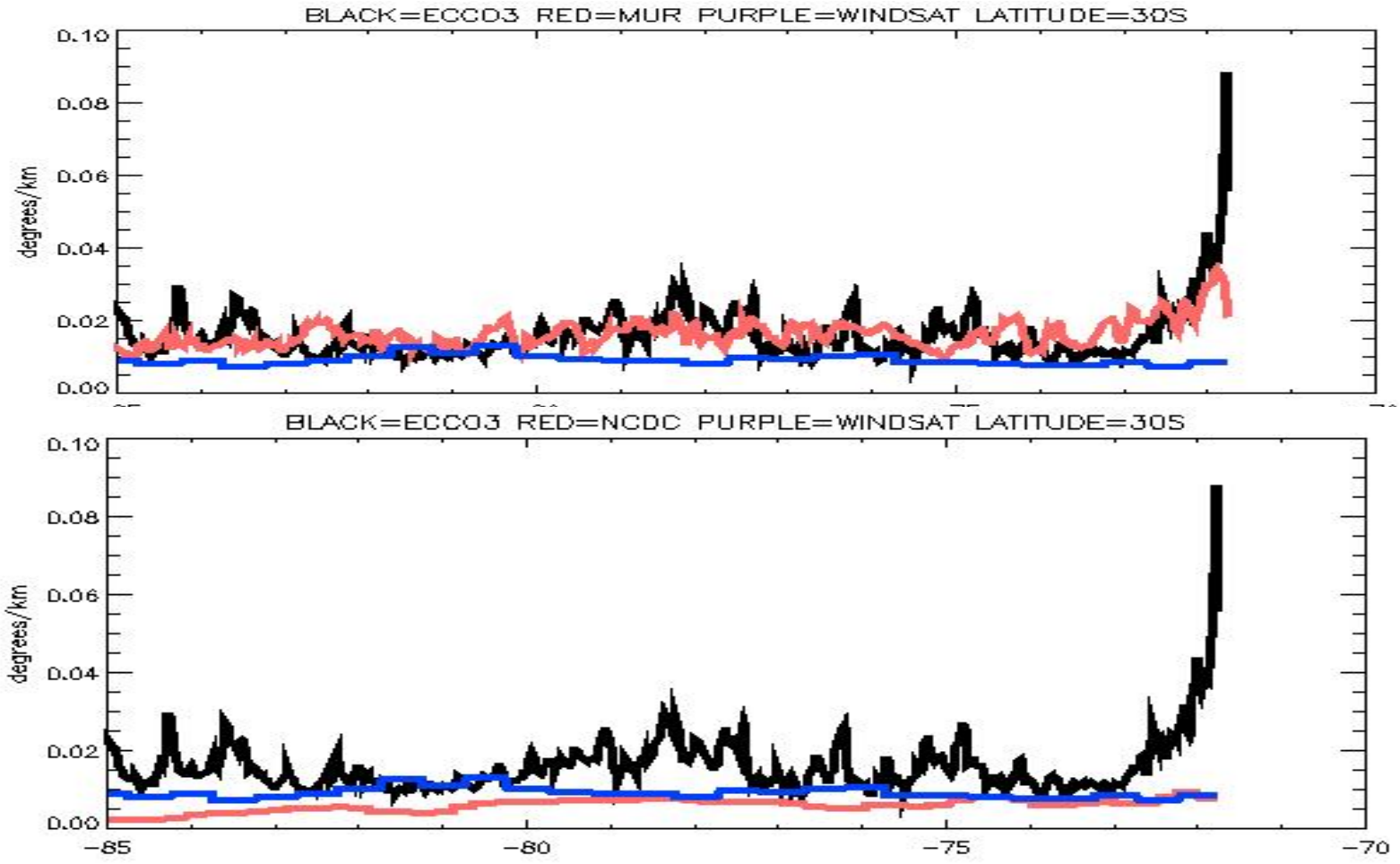


Covariability ECCO2 Mode 1 MUR and NCDC

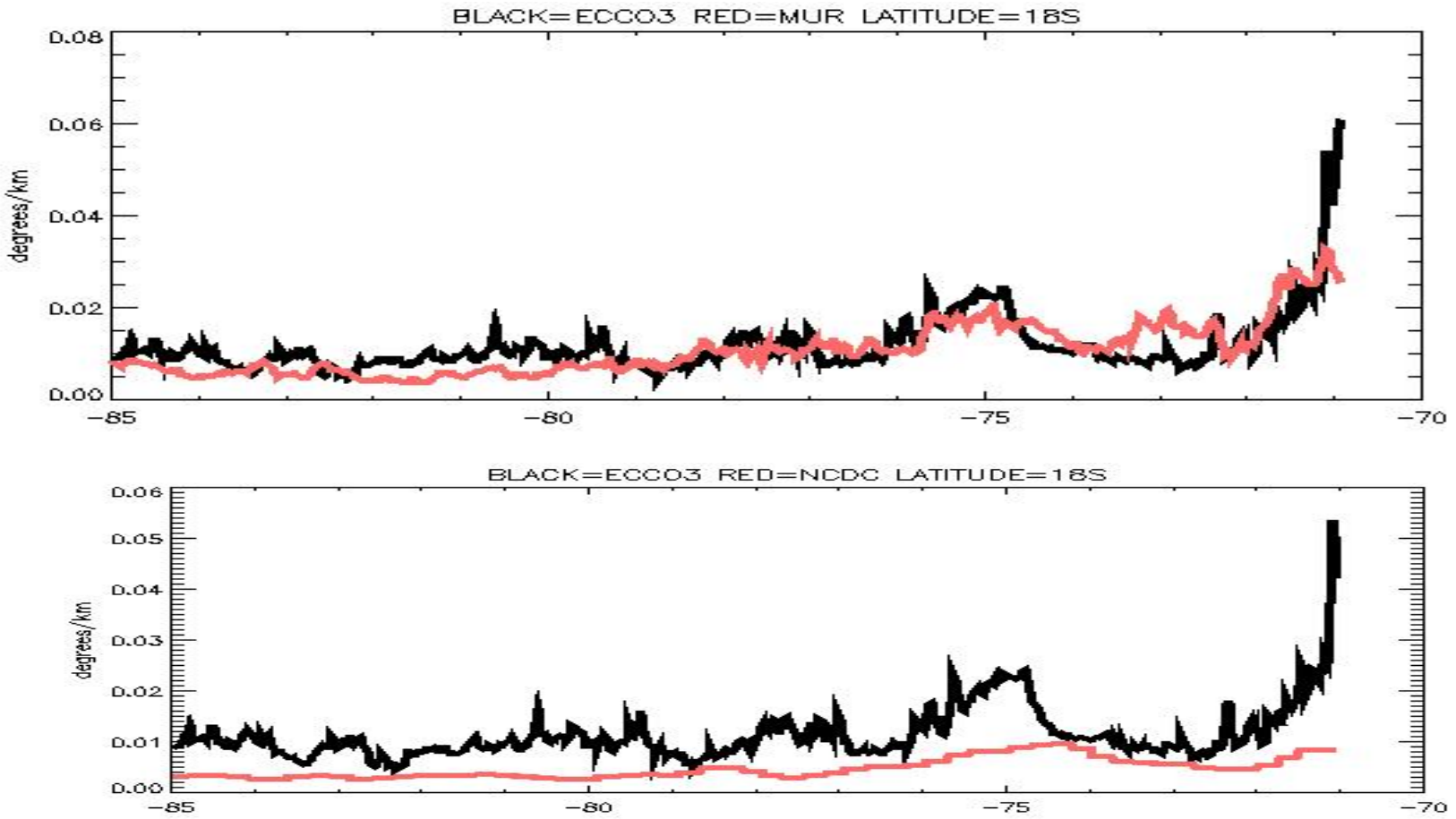




SST gradients along 30S for Covariability (Mode 1) ECCO2, MUR and NCDC



SST gradients along 18S for Covaribility (Mode 1) ECCO2 and MUR and NCDC



Conclusions

- **A covariability analysis of SST gradient magnitudes derived from a 2km ECCO2 model output and MUR and NCDC level 4 products indicates much smoother gradients found in the 0.25 NCDC product that do not resolve the upwelling scales seen along the South American Coast.**

- **Correlations of 2km ECCO2 and MUR are consistently higher for the first mode of covariability than for ECCO2 and NCDC.**

- **Comparisons with SST gradients from WINDSAT indicate that MODIS and AVHRR are adding critical high resolution information for resolving upwelling scales, especially**

- **Results seem to indicate that South of 25S the lower resolution SST products are not resolving smaller scale upwelling features. Windsat microwave data alone is not resolving upwelling scales along the South American Coast. Future work will focus on confirming scales and connection to forcing mechanism.**

Bottom Line

Good, High Resolution is