Teleconnection patterns in the Southern Hemisphere in subseasonal to seasonal models hindcasts and influences on South America

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- **This study is part of the CLIMAX –FAPESP-Belmont Project**

Climate Services Through Knowledge Co-Production: An Euro-South American Initiative For Strengthening Societal Adaptation Response to Extreme Events.

The project has 3 main working groups:

- **WP0- Co-design and Co-Production of Knowledge**
- **WP1: Physical processes explaining climate variability in SA**
- **WP2: Predictability and Prediction tools**
- **WP3: Social processes explaining climate information appropriation**

The present study complies with WP1 and WP2

The objective is to analyse teleconnections in hindcasts of subseasonal timescale and the relations to precipitation anomalies over South America.

Data and method

- Period : DJF 1999-2009
- S2S data: hindcasts of weeks 2, 3 and 4
- Geopotential 200 hPa: ERA5 and S2S ECMWF, NCEP
- **1. EOF analyses :**

EOF1: Southern Annular Mode (SAM)

EOF2: PSA

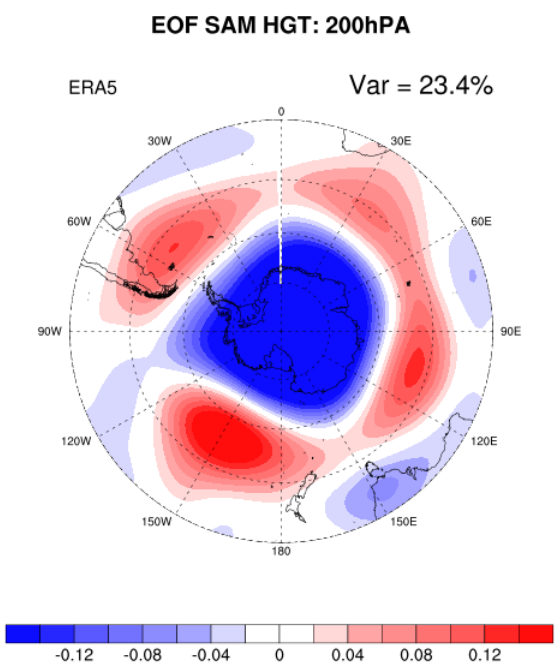
- **2. Composites of weeks with extreme + and – amplitudes**

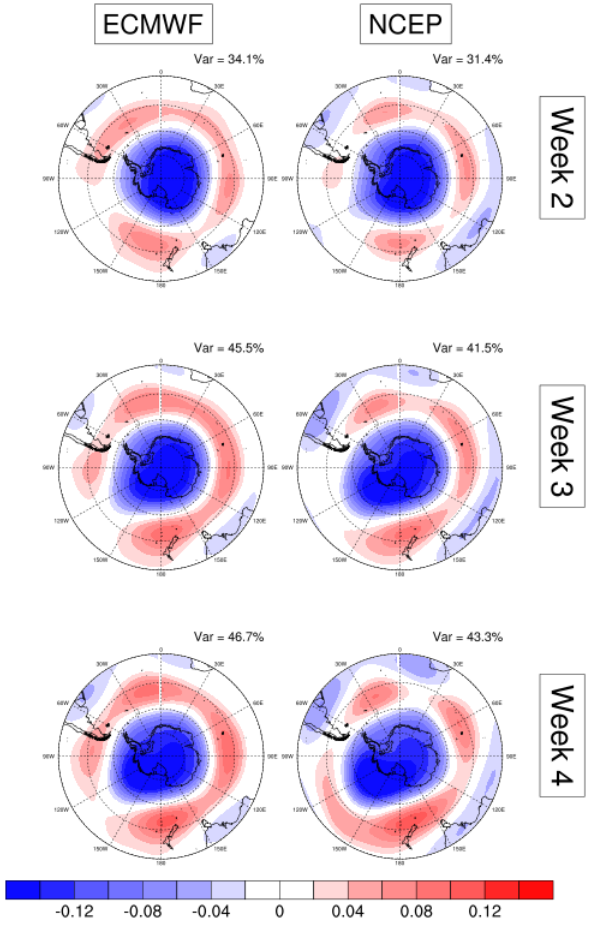
Geopotential at 200 hPa (ERA5, ECMWF, NCEP)

Precipitation (GPCP, ECMWF, NCEP)

EOF1- SAM

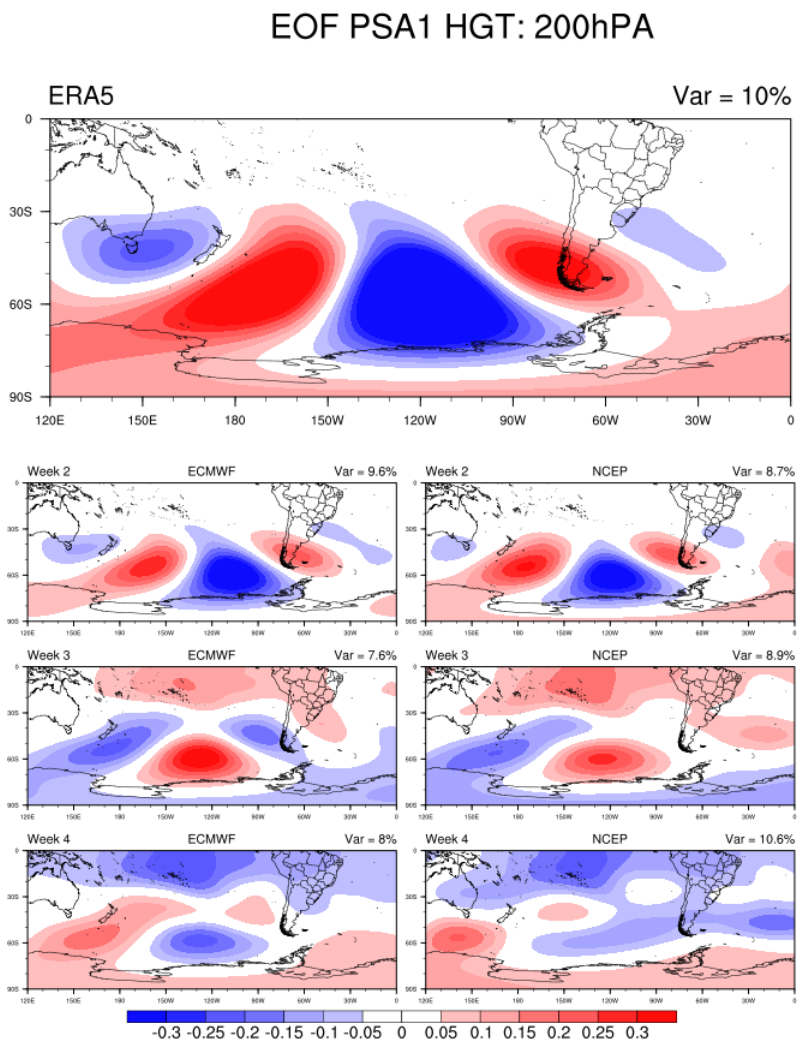
ERA5





The predictions of both models for weeks 2 to 4 show the SAM pattern of polar signal opposite to the middle latitudes, similar to reanalysis.

EOF2-PSA



PSA pattern is well represented in predictions of week 2 of both models and week 3 of ECMWF. The pattern is not represented at week 4.

The wavetrain affects South America with centers of action that contribute to precipitation anomalies.

Conclusion

- The S2S predictions of ECMWF and NCEP represent the SAM pattern from week 2 to 4, and the composites of extreme amplitudes show the opposite relations of precipitation over Southern Brazil in opposite phases of SAM.

- PSA pattern is well represented in weeks 2 and 3 by ECMWF. Only week 2 is well represented by NCEP. Predictions for week 4 dont represent the pattern. Composites of precipitation represent the anomalies consistent with the PSA pattern.

- Next: Analyses of specific cases to see the feasibility of aplications to predict anomalies for weeks 2 and 3.