

US CLIVAR MJO WG

Telecon Minutes

November 29, 2006; 1:00pm-2:30pm US West Coast

Telecon Participants: Stern, Waliser, Weickmann, Zhang, Maloney, W. Wang, Sperber, Vitart, Wheeler, Hendon

MJO Simulation Metrics: Wheeler and Hendon walked us through a PPT file that showed a number of sensitivity calculations regarding their combined EOF approach to isolating the MJO. The main point was the by doing an all-season, rather than seasonally-dependent, derivation of the EOFs, one retains nearly all the variability and can isolate the eastward propagating – and to a great degree the northward propagating summer component – quite well. The method is found to be quite good at isolating the combined variability in the first two EOF modes. The PPT file is posted to the MJO WG web site. There was some discussion that there may be a need in the future to have an alternative method or variation of this method that might more precisely describe northward/northeastward propagating components of the boreal summer MJO mode. It was thought that possibly the next CLIVAR AAMP meeting might be a good venue to raise this issue. Ken and Harry – as members of AAMP - will be asked to brief the AAMP on MJO WG activities at their next meeting. Based on the presentation and earlier discussions, the WG adopted the use of this methodology to serve as a advanced/level 2 metric for MJO simulations. The WG also discussed the virtue of the Wheeler and Kiladis approach to 2D spectrum versus the coh^2 that has recently been developed and discussed by Hendon and Wheeler and both were thought to have virtue. The former because it has already been in some use by the community, and the latter because of its simplicity of calculation. More discussion on that will be undertaken during the next telecon.

Daeyun Kim, graduate student of In-Sik Kang from Seoul National University, has been working on developing a web site to present the metric calculations and data. He has successfully recalculated and plotted nearly all the level 1 metrics from a number of different data sets. The web site is at: http://climate.snu.ac.kr/mjo_metrics/table_level1.htm. Having his participation is tremendous. For the next phase of this process, we will get him and Wheeler/Hendon in more direct communication so that he can proceed to calculate the level 2 metrics and put them onto the web site as well. The WG decided for the moment to keep the information in its entirety on the SNU host until a later time when it is complete and then it may be transferred to the US CLIVAR web site.

Web Site: An additional page on MJO and African rainfall is being developed by Pierre Camberlin, Benjamin Pohl, and Peter Omeny.

Forecast Metrics: We discussed the methodology for proceeding with defining metrics for forecasts of the MJO. The WG felt that the combined EOF approach of Wheeler and Hendon would be a useful start in quantifying forecast skill. Although the methodologies of then how to compare model to data raises some issues that need significant more discussion. Do we use RMS, correlations, etc. What to do for computing anomalies if a model for example does not have a lead-dependent climatology? Are there specific things for the boreal summer monsoon, where MJO forecasts need to be exploited, that are not sufficiently represented by the combined EOF approach and associated phase composites. Again, this is something that will be raised at the next CLIVAR AAMP meeting. Harry is to ask Bin Wang (co-chair) of AAMP about getting an NCEP representative to the next AAMP meeting.

Next Steps: Proceed with refining the metric web site for level 1 metrics, add level 2 metrics including the combined EOFs, w-k plots, and mean fields, etc. Proceed with more discussion on the forecast metrics. Continue to plan for the proposed MJO workshop.

Comments and Questions about Metrics Developed/Computed to Date (refer to *Simulation Metrics* document)

1) Variance maps

No modifications.

2) Regional Spectra

For OLR and precipitation, Duane and Klaus have selected consistent boxes for area averaging. Duane's decay time scales are faster, and this raises issues regarding statistical significance and estimates of the degrees of freedom for calculating the rednoise level. We need to make sure that all follow the same procedure.

3) EOF's of individual fields

Issues regarding consistent methodology of rednoise calculation for projecting unfiltered data onto the EOFs and then computing their spectra remain, in particular estimation of number of degrees of freedom (as in item 2).

Agreed to calculate North criterion in addition to above projection method to provide multiple choices for assessing whether an EOF should be retained.

4) Lag regressions

a) PC-1 vs. PC-2: no modification

b) Longitude-lag, latitude-lag

Klaus: Surprisingly, phase speeds are faster than thought, at 6-7 m/s with TRMM having a faster phase speed than what we have observed in the past 4-5m/s). Is this due to a regime change or is it an unresolvable difference?

Correlation was thought to be ok instead of regression.

Boreal summer: Need to prescribe the longitude domain for latitude-lag plots. CMAP is more symmetrical about the equator than OLR. One possibility is that the different longitude domains used may have contributed to this discrepancy. Ken noted caution in using this metric as conclusive identification that northward propagation is present. He noted model data in which westward propagation at continental latitudes intersected with intensification of near-equatorial convection, thus giving rise to what appeared to be northward propagation. Ken suggested that longitude-lag plots averaged between about 15N-20N also be used to conclusively indicate the northward propagating component actually occurs from west to east movement of the tilted rainband. He noted that this was based on projecting model data onto the dominant observed boreal summer OLR pattern, and this discrepancy may be alleviated when the composite OLR, u850, u200 analysis of Wheeler and Hendon is used. Figures illustrating this will be forthcoming.

Consistent determination of phase speeds from space-lag regressions and EOFs/PCs needed.

5) Discussion and Caveats:

No modifications.

6) Future items

No modifications.

7) Frequency-wavenumber plots

Freq-wave number: need to explore removal or annual cycle for seasonal calculation. Klaus raised objections of multiplication of power by frequency for these plots (which is done for the spectra discussed above), as this may not be proper(?) in wavenumber space. So for now, it was agreed we won't do this.

For the full data set, it was agreed to process the data yearly (Jan 1-Dec 31) and then average individual spectra together.

Note: nobody provided the ratio of the eastward vs. westward power. This may be important when processing models that exhibit more symmetry.

Wheeler-Kiladis spectra are an integral part of the literature, so consideration to providing these metrics should also be considered. Harry provided a revised methodology that involves computing the co-spectra that allowed one to bypass generation of a smoothed background spectra for bringing out the equatorial modal structures. For now, we are considering the inclusion of both methods.