

## ***Interactive comment on “S<sup>4</sup>CAST v2.0: sea surface temperature based statistical seasonal forecast model” by R. Suárez-Moreno and B. Rodríguez-Fonseca***

**Anonymous Referee #1**

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The article describes a software package that helps to analysis the lag-lead relationships between climate variables, which could be used for forecasts. The article describes some technical aspects of the software package S<sup>4</sup>CAST v2.0 that read like a software documentation or instruction, but it also discusses an example of Sahel rainfall, which is more like science discussion of climate variability or predictability. In particular the introduction is much more focussed on the Sahel rainfall than on the software that is being introduced here. The software "S<sup>4</sup>CAST v2.0" introduced here may be of some value for the climate research community. However, I feel that the article would need some substantial revision to be publishable. I therefore recommend major revisions. Detail comments are listed below.

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Major comments/points:

1) Aim of paper: It is not quite clear what the aim of this article is. It seems that it is introducing and describing the use of the software package "S<sup>4</sup>CAST v2.0". But much of the introduction, references and analysis is on predicting Sahel rainfall. I feel that much of this Sahel rainfall discussion is distracting from the main aim of this paper: Introducing a software package for statistical analysis. I think the paper needs to be substantially rewritten to have a clear focus. More space need to be given on how the software is used.

2) "stationarity": The authors emphasis "non-stationarity" a lot. They argue that they have illustrated "non-stationarity" (in section 3.2.1 and later). I dont see how they have shown that something is non-stationary and how they have statistically test for stationarity. Running mean correlations over a 21 year period, will by construction go up and down. How can you define a stationary period in this? And how do you know if two periods have different statistical properties (they are not stationary between the two periods)? This needs to be presented much clearer, as it appears to be one of the main issues of the article.

An example of such a discussion:

Gershunov et al. 2001: Low-frequency modulation of the ENSO-Indian monsoon rainfall relationship: Signal or noise? J. Climate, 14(11), 2486-2492.

3) Version 1 of "S<sup>4</sup>CAST v2.0": The authors state that this software package is version 2 of "S<sup>4</sup>CAST", but it is not clear where version 1.0 has been published. It seems version 1.0 has not been published in peer review? Then it would not be available for most readers? So whatever information maybe provided in version 1 would need to be provided here too.

4) Introduction of the software: I think it would be very helpful if the example discussed is also provided as a MATLAB-script, which explains how this is done and how the

C1199

software is used.

Minor comments:

\_\_\_\_\_ page 3987, line "SL1": Is not explain in the text before it has been used here.

\_\_\_\_\_ analysis Fig.4-6: what are the domain boundaries to which the explained variance values refer to? Figure captions indicate its the boxes shown in Fig4-6?

\_\_\_\_\_ Fig.4-6: The headings in panels a and b show some numbers that are not explained.

\_\_\_\_\_ page 3989, line 14-16: "The results presented above support the existence of a non-stationary behaviour of 15 the teleconnections between SSTA variability and rainfall associated with WAM which has been referenced in the previously mentioned works. ":

I dont see how this has been shown.

\_\_\_\_\_ page 3989, line 28 "... validation is computed. ": What does this mean?

\_\_\_\_\_ Fig. 9-11: Order of discussion wrong / fig 9 was not discussed.

\_\_\_\_\_ page 3990, line 26 "The results of CPT are not so good as those using S4CAST.": What does "good" mean? Are the authors saying the CPT methods is not as good as their own method? I think this has not been demonstrated here.

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Interactive comment on Geosci. Model Dev. Discuss., 8, 3971, 2015.

C1200