

Second review of manuscript HESS-2022-67 entitled “Probabilistic sub-seasonal precipitation forecasts using preceding atmospheric intraseasonal signals in a Bayesian perspective” by Yuan Li, Zhiyong Yu, Hai He and Hao Yin

OVERALL RECOMMENDATION

Minor revisions

MAJOR COMMENTS

The authors have satisfactorily taken into account the vast majority of my comments. I think this manuscript is far better than the previous version and can be published after correcting some typos and answering to the two points below.

1) I’m glad the authors have decided to compare the scores of their statistical forecasts to those of a dynamical S2S system. However, I am dubious about the choice of NCEP which is not reputed to be the best-performing one, as they acknowledge.

The authors seem to imply that except for NCEP, it is not possible “to generate pentad mean precipitation forecasts for the same period as the STP-BHM model” (l.420-421). But actually, the problem could be turned the other way round by providing STP-BHM forecasts matching the pentad mean precipitation of another S2S system, e.g ECMWF. It seems entirely feasible since STP-BHM is a purely statistical model.

I would therefore suggest a comparison with ECMWF, that would give even more importance to your statistical method if you beat it, although I consider it optional for this revision. At least, I think you should modify the sentences claiming that other comparisons are not possible (in Sections 2.1 and 3.1).

2) I am surprised to see an evaluation for both precipitation amounts and precipitation anomalies. I do not say it is irrelevant, but it is quite uncommon in the context of verification of S2S precipitation and I would have expected only one of them (presumably anomalies). I would be interested if you briefly discussed why you chose to look at both, and why the results differ. In the meantime, I think the article could be shortened by not repeating all verification charts twice (e.g the attribute diagrams and the Brier score could appear only once).

MINOR COMMENTS

l.119: Please specify the meaning of the STP-BHM acronym here. Although it appears in the abstract, it should be detailed once in the main body of the article.

LANGUAGE AND TYPOS

l.58: “which the predictors were identified” → “whose predictors were identified”

l.104: “The predictand is assumed to follow **a** distribution” (missing word)

l.124: “dataset” or “datasets”?

l.149-150: “In addition, the correlations between geopotential height at 850 hPa, 500 hPa, and 200 hPa (H850, H500, H200) are also analyzed.” There’s a missing “s” for “correlations”, and the sentence is not clear. I guess you should either write “the correlations between geopotential height (...) and precipitation” or simply “the correlations with geopotential height” (as precipitation is already mentioned in the previous sentence).

l.184: “where the correlation **is** statistically significant” (missing word)

l.382 to 387, l.444 to 448: “**B**rier” (upper case B)

l. 422: “it is not **a** surprise” or “it is not **supr**ising”