

Interactive comment on “Wavelet analysis of the singular spectral reconstructed time series to study the imprints of Solar–ENSO–Geomagnetic activity on Indian climate” by S. Sri Lakshmi and R. K. Tiwari

Anonymous Referee #1

Received and published: 25 October 2015

General comments:

In this manuscript, the authors performed the detailed analysis of the relationship between the Solar-ENSO-Geomagnetic activity and the Indian climate of the last century by using the Singular Spectral Analysis (SSA) and wavelet analysis. A main conclusion of the study is the existence of the Solar activity and ENSO frequencies in the temperature tree ring record from the Western Himalayas.

The results presented in the manuscript are relevant and sound. Therefore, I recommend the acceptance of the manuscript; however, I would like the authors to consider
C533

the following points in order to improve the readability of the manuscript:

Specific comments:

Introduction

1) Page 1449, lines 8-11: Could the authors please clarify the following sentence? Or maybe split it into two? 2) Page 1450, line 6: Could the authors please add a reference to the sentence before “Recent studies“?

Methods 1) Could the authors please clarify, which kind of events they are referring to on line 15, page 1456?

2) Page 1457: I assume, the authors meant “sliding window“ instead of “sliding method“?

3) Page 1458, equation 8: explanation of W is missing

4) Page 1457: explanation of a is missing

Results and discussion

1) Page 1459, line 8: Could the authors please replace “have taken“ with “analyzed“? The latter “and analyzed“ should be removed from this sentence.

2) Could the authors please remove the repetitions in the text of the manuscript, as for example in the lines 22-23 (page 1569) about “we have applied the PCA“?

3) The authors during the discussion of the results and in the figures change the order of considered data (WH-SSN-SOI or SSN-WH-SOI). In order to make it easier for the reader to follow the flow of the manuscript, I would recommend preserving the order of the considered data in the figures and well as in the manuscript describing the figures.

4) Page 1462, line 1: I would recommend replacing “checking the breaks in the eigen value spectra“ with “identification of gaps“. This would improve the readability of the manuscript.

5) In line 19, the authors mention the role of internal oscillation of the atmosphere-ocean system on the Indian monsoon system identified from the Figure 8, however, before was mentioned that the pre-monsoon data was studied. In order to avoid the confusion, I would recommend to substitute “monsoon“ with “climate“ or to clarify this sentence in another way.

Conclusion

1) In the first sentence of the conclusion, the authors point out that they “presented here a new spectral approach to identify the periodic patterns...“. I would suggest to re-write this sentence, as it gives misleading impression to the reader that the main goal of the manuscript was to propose a new methodology, while from the rest of the paper, the reader concludes that the main goal was to investigate the imprints of the Solar-ENSO-Geomagnetic activity on Indian climate using the methods that have been established earlier. Could the authors please clarify this question?

2) In the second sentence of the conclusion (lines 5-7) the authors state that analysis highlights “the removal of noise in the data“. While the second part of this sentence clearly states results of the manuscript, I would suggest the authors to re-phrase “the removal of noise in the data“ as a method, and not a result. Possibly, something along these lines could improve the readability: “..and the wavelet analysis of the SSA reconstructed times series, along with removing of the noise from the data, identifies ...“

3) The authors point out on the existence of 33, 11 and 2-7 years frequencies in the Western Himalaya temperature record, however, while 11 and 2-7 years frequencies are explained by the Sunspot-geomagnetic activity and ENSO variability, there are no comments regarding the 33 cycle in the conclusion of the manuscript. I suggest, that adding the conclusions (maybe one sentence) regarding the 33-year cycle would add to the understanding of the factors influencing the temperature variability in the Western Himalayas and would clarify the importance of results.

C535

Technical corrections:

Introduction

Page 1451, line 20: evidence “of” instead of “for“

Data

Reference for the tree ring data is missing

Methods

1) Page 1454, lines 5 and 17: Step appears twice. 2) Page 1455, line 9: which “is“ and additive, “If“ instead of “if“, “stands“ instead of “strands“; line 11 – “i“ instead of “I“. 3) Page 1456, lines 17,19: Repetition of “mother wavelet“. 4) Page 1456, line 2: a new paragraph could start here 5) Page 1456, line 4: word “method“ is probably missing. 6) I would recommend adding “In particular,“ in the line 9, page 1456 after the reference to Webster 1999. 7) Please check the consistency of the spelling of Morlet wavelet throughout the manuscript: capital “M“. 8) Page 1463, line 13: “play“ instead of “plays“, “of“ the land surface 9) Page 1463, line 27: influences of what?

Conclusion 1) Could the authors please spell out the WH abbreviation in the conclusion specifically? This would improve the readability of this part of the manuscript.

2) Line 16: “Indian subcontinent“ instead of “continent“

Acknowledgements

1) The authors thank R.R Yadav for proving “his“ data, however, do not specify which data. Could the authors please add this information?

Figures Could the authors please add all the information and abbreviation which is present on the Figures in the caption of the Figures?

1) Figure 1: what are the coordinates of the data where they were taken from?. Caption a) – please add abbreviation WH after the Western Himalayas 2) Figure 2: Could the

C536

authors please increase the font of the numbers on the subfigures? They are very hard to read currently. Also, x and y-axis labels are missing 3) Figure 3: I would suggest removing the black lines separating the subfigures. 4) Figure 5: Could the authors please spell out abbreviation in the caption to this Figure? 5) Figure 6: Please add the labels to all subfigures. Upper left corner Figure contains 2 arrows, but one subplot. Please clarify. Similar for the lower left figure. I would also recommend increasing the fonts and labels on the subfigures. Another possible solution would be to split this figure into two figures. 6) Figure 7: Please add labels to the right-hand side subplots. 7) Figure 9: Please increase the fonts, and add units to both axes.

Interactive comment on Nonlin. Processes Geophys. Discuss., 2, 1447, 2015.