



SDI Review Form 1.6

Journal Name:	Physical Science International Journal
Manuscript Number:	Ms_PSIJ_30319
Title of the Manuscript:	Multifractal Analysis of Sunspot Numbers During The Solar Cycle 23 and Ascending Phase of Cycle 24
Type of the Article	Original Research Paper

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

To know the complete guideline for Peer Review process, reviewers are requested to visit this link:

(<http://www.sciencedomain.org/page.php?id=sdi-general-editorial-policy#Peer-Review-Guideline>)



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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	- The paper lacks a proper usage of English. The author(s) have to rewrite/correct several paragraphs and phrases. - Line 24: Why the sunspot time series is random? What is the meaning of randomness in this case? - This is not the proper way of writing a reference in the text. E.g. (line 33): The multifractal scaling behaviors reported by [7] are valid (... etc...). The <u>proper</u> way is: The multifractal scaling behaviors reported by Movahed et al. [7] are valid (... etc...). The same phenomenon is repeated all along the paper (eg. Line 88). - Line 40: Multifractility (?). Do they mean Multifractality? - Some verbs are in past tense, and some in present (eg. Lines 42-43) - The link in Line 49 does not exist. Apart from that problem, the official, corrected and complete data set of sunspot number can be found in: http://www.sidc.be/silso/datafiles I would advise the authors to visit the website of SIDC and download the new version of data set of sunspot number without (as they mention) missing values! - In section 3.6 the authors repeat what a Wavelet analysis is, like in section 3.1. - The Conclusion section has to be a section where the results are presented in a brief way, while the authors have to provide the main points of their analysis. In the present paper, the 4th Section (Conclusion) seems to me like an epilogue of a story, repeating again the main points of wavelet theory. The authors have to stretch out their results and explain them briefly. - It is not clear to me why the authors have chosen the Solar Cycle 23 and the ascending phase of Cycle 24. The Sunspot	Now we have improved as possible. Corrected it in the text with the suitable reference. Now, we have arranged accordingly journal and your suggestion. According to Abramenko: multifractality is a property of non-linear dynamical system in which energy dissipation cannot be neglected. Our Sun is one of such systems. We have corrected it. As the text file we have found the dataset on that link provided in text. In section 3.1 we have introduced Wavelet Transform Technique as theoretically however



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	number time series begins in early 1600 (with Galileo) and reaches the present days and the investigation of one or two isolate Solar Cycles would seem to my eyes rather improper, if we want to have a global image of the fractality or multifractality nature of the Solar activity. I would, also, point out that the Cycle 24 is about to close, and I would strongly suggest that the authors use the full data of Cycle 24 in order to compare them with the previous Cycle 23. • The figures could be described in more detail, and be explained for the non-specialists on wavelet theory. • The section 3.5 is called “Results and Analysis”, while it is so important, it is just one paragraph with 4 lines! • General remark: The authors did not follow the guidelines of the template given in the webpage. The numbering of their sections is not according to the guidelines, while not all the references are written in the style of the guidelines. • I would also suggest that the authors should take into account the references mentioned below: Clette, F., Svalgaard, L., Vaquero, J.M., Cliver, E.W.: “Revisiting the sunspot number. A 400-year perspective on the solar cycle”, 2014, <i>Space Sci. Rev.</i>, 186, 35 Hoyt, D.V., Schatten, K.H.: “A new look at Wolf sunspot numbers in the late 1700's”, <i>Solar Phys.</i>, 1992, 138, 387 Schatten, K.H.: “Solar activity and the solar cycle”, <i>Adv. Space Res.</i>, 2003, 32, 451 Zachilas, L. & Gkana, A.: “<i>On the verge of a grand solar minimum: A second Maunder Minimum?</i>”, <i>Sol. Phys.</i>, 2015, 290 (5), 1457 – 1477 (DOI 10.1007/s11207-015-0684-1) Gkana, A. & Zachilas, L.: “<i>Re-evaluation of predictive models in</i>	in section 3.6 (now in text 3.5.1) it is used on time series so for. We have improved the conclusion section according to your suggestion. We are going through the analysis to reveal the features of Solar Cycle 24 with another Solar Cycle as 23 we have considered. Yes, we have described it. It was mistake done by us. Now it is corrected. Now, all the instruction and guidelines of the template are followed by us. We have arranged all the references accordingly the journal and your kind
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	<i>light of new data: Sunspot Number Version 2.0"</i> , Sol. Phys., 2016, 291 (8), 2457 – 2472 (DOI 10.1007/s11207- 016-0965-3)	suggestions.
<u>Minor</u> REVISION comments		
<u>Optional/General</u> comments		