

Earth Syst. Dynam. Discuss., referee comment RC1
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Comment on esd-2021-43

Anonymous Referee #1

Referee comment on "Climate change in the High Mountain Asia in CMIP6" by Mickaël Lalande et al., Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2021-43-RC1>, 2021

Review Comments

The manuscript is based on a very important topic of the Climate Change in the High Mountain Asia using CMIP6 data for temperature, snow cover and precipitation. Different observed and reanalyzed data were used for the different parameters in the study to get the most appropriate picture. The authors here attempt to address performances of 26 CMIP6 GCMs over HMA for the historical period 1979-2014 and the future projections. 10 models were considered for the future projection and related analysis based on the availability of the 4 SSPs scenarios (SSP1-2.6, SSP2-4.5, SSP3-7.0, and SSP5-8.5) to estimate the anthropogenic emissions. The results may have some implications for the academic community. However, there are several areas where the manuscript can be improved. I have few comments that I am giving below:

Minor comments

- Use the term either "Snowpack" or "Snowcover" (L: 58).
- L: 89 sentence "Sections 6" Should be restructured".
- Meaning of the sentence in L: 220 "Whenever possible....." is not clear. What are other datasets?
- A little more elaboration on the temperature is required in Section 3.2 to put light on the obtained results in the study.
- Sentence "For temperature, ERA-Interim....." (L: 252-254) is not in the flow of the preceding text and therefore need elimination from the manuscript.
- Use either "Sect." or "Section" in different paragraphs of the manuscript.
- Why is the in-depth discussion on APHRODITE missing in this Section 3.2 ?
- More description in Section 3.3 on the temperature, snow cover and precipitation is required to show the bias.
- Sentence "Correlation between temperature and snow cover....." (L: 300-303) should be part of Section 3.4.

- Rather than temperature only, section heading of Section. 3.3 needs to reflect the snow cover as well as precipitation. Add more text in Section 3.3 for the discussion on precipitation.
- Which test was adopted for the significance of the correlation and how was the level of significance selected to declare the value significant ?
- Mention the threshold limit selected to declare the trend results significant in Section 4.1.
- Comments on the figure and the tables have not been made at my end. Please add it!

Please also note the supplement to this comment:

<https://esd.copernicus.org/preprints/esd-2021-43/esd-2021-43-RC1-supplement.pdf>