

Geosci. Model Dev. Discuss., referee comment RC2  
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## Comment on gmd-2021-54

Anonymous Referee #2

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Referee comment on "Precipitation over southern Africa: is there consensus among global climate models (GCMs), regional climate models (RCMs) and observational data?" by Maria Chara Karypidou et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2021-54-RC2>, 2021

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This paper evaluates the representation of the southern African rainfall in the GCMs and RCMs compared to a set of observational data. The rainfall climatology, annual cycle, trends and a couple of ETCCDI indices are analyzed along with the representation of the Angola Low, which is one of the important driving circulations that affect the rainfall in the area. The paper is of high importance for model improvement. However, I suggest the following comments to be addressed before the paper could be published in GMD.

Major comments:

- Page 8, 235-240, an evaluation of the moisture transported through the north-easterly monsoon should be performed here to support the hypothesis that the improved representation of the topography led to a lower bias in the CORDEX models.
- Page 9, section 3.3. It should be made clear why there is a special focus on the Angola low given the different processes that significantly affect the rainfall in the area. For example, the cloudband or tropical temperate trough is one of the major processes that drive rainfall in SAF but is never mentioned here. I would even suggest including the cloudbands in the analyzes.
- Page 9, section 3.3. I wonder why theta850 is used to calculate the Angola low instead of the geopotential height (as in Munday et al., 2017) or the vorticity (as in Howard et al., 2018). The CMIP6 models do have these variables available and should be used for a fair comparison.
- Page 9, section 3.3. Apart from the strength of the Angola Low, its position also plays an important role, which I suggest being included.
- Page 10, Section 3.5. It would be good to also see how many models agree on the sign of the trends in addition to the significance in Fig S5.