

Interactive comment on “Improving the representation of anthropogenic CO₂ emissions in climate models: a new parameterization for the Community Earth System Model (CESM)” by Andrés Navarro et al.

Anonymous Referee #1

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The paper is very interesting, novel and merits immediate publication. The approach is that of a ‘proof of concept’, but the idea behind the research is extremely interesting and worth of attention by the community.

However, I believe the authors must touch upon several topics in order to improve the paper. Specifically:

-Last part of section 3.1 needs further explanation. Please expand the section and provide more information about potential applications. I think that is an important part

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of the paper (probably the most important part), and it is a pity that the authors give just such a swift account of the topic. Â

-Given the large number of papers using CESM I think more attention should be devoted to previous work using this model. Please add several references to show how CESM has been used, including merits, shortcomings and the like.Â

-The double ITCZ issue needs referencing. Who did first mention that? Without such reference it seems that that feature is a novel observation from the authors, which I think it is not.

-The following sentence is confusing to me. ÂThe improvements of POPEM for the El Niño-4 area show that detailed, dynamical modeling of GHG emissions is important for more precisely quantifying precipitation in dry areas, which validates the main hypothesis of the paper.ÂPlease explain what do you mean by that.

- Please, check the references to the figures in the text (Figs. 4 and 5)

- Please, check the place where you put the definition of some acronyms (e. g. ITCZ -you use it on page 7 and is defined in page 10-, SST -similar-).

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