

Interactive comment on “Climate model projections from the Scenario Model Intercomparison Project (ScenarioMIP) of CMIP6” by Claudia Tebaldi et al.

Anonymous Referee #2

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The authors present the results of CMIP6 ScenarioMIP focusing on surface air temperature and precipitation. They find similar characteristics in the temperature and precipitation patterns to those simulated by CMIP5 models. They also depict the temperature and precipitation changes under the new scenarios in CMIP6, such as SSP1-1.9, SSP3-7.0 and SSP5-3.4OS.

This is a comprehensive study of CMIP6 ScenarioMIP, summarizing the results of multiple global warming scenarios from CMIP6 and providing some new insights. However, I feel some clarifications are needed to justify the results.

Lines 212-213 “This suggests that the model response uncertainty increases for

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stronger responses”. Why does model response uncertainty increase for stronger responses?

Line 223: The authors define “separation”, and use “a 21-year running mean” (Line 227) and “choose 0.1°C as the threshold” (Line 228). Why is a 21-year running mean used here instead of a 9-year or 11-year running mean? The latter two running means I can understand aim to minimize the interannual variability, but what is the purpose of the 21-year running mean? Will the results of “separation” be sensitive to the two parameters of the running mean and 0.1°C ?

Fig. 1. Are they annual mean time series of temperature and precipitation?

Part 3.1.3 Would be it possible to show the difference between the SSPs and RCPs more explicitly? For example, plot the time series of the differences of temperature and precipitation between the SSPs and RCPs? Also show the spatial pattern of the difference, i.e., the global map of the difference of temperature and precipitation change/trend in the 21st century between the SSPs and RCPs? Besides, please explain why are SSPs induced changes different from their corresponding RCPs? What is the factor accounting for the difference and through what processes?

Additionally, please note the superscripts and subscripts in the denotations. For example, “ 2.6Wm^{-2} ” (Line 364), “ 0.5Wm^{-2} ” (Line 400), “ CO_2 , CH_4 and N_2O ” (Line 419).

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