Assessing the quality of Reanalyses trends in the Southern Hemisphere Stratosphere-Troposphere through the use of CMIP5 models

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Long-term changes in the Southern Hemisphere circulation in the austral spring–summer season have been extensively studied, reaching a consensus across modelling and observations studies that stratospheric temperature changes due to Antarctic ozone depletion are the dominant driver of those changes over the period in which ozone was rapidly being depleted. Recent studies have focused on the ability of the Coupled Intercomparison Project Phase 5 (CMIP5) models to reproduce changes in temperature and circulation, by comparing simulated trends with reanalyses, and highlighetd the role of the stratospheric dynamics representation in models to partially explain simulated biases (e.g. Rea et al., 2017). However, discrepancies across trends in reanalyses also emerged in those studies. Recently, Massonnet et al. (2016) have proposed a new paradigm, where climate models may be used to assess the quality of observational references. Based on that approach, in this analysis we propose the use of CMIP5 long-term trends to evaluate trends in "more recent" versus "older" reanalyses in the Southern Hemisphere troposphere-stratosphere coupled system. We will focus on temperature trends that are more robust and have been extensively studied.

Key words: Southern Hemisphere trends, Reanalyses evaluation, CMIP5 models

References

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