

HARMONIC ANALYSIS OF CLIMATOLOGICAL TEMPERATURE AND WINDS OVER ANTARCTICA: GREENHOUSE WARMING AND PRESENT DAY PERSPECTIVES

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Based upon NCEP and ERA40 reanalyses and climate simulations from four climate models (CCCma, CSIRO, HADCM3 and CCSRNIES) that support the Intergovernmental Panel on Climate Change Fourth Assessment Report (IPCC), we have provided an additional investigation of the simulated southern hemisphere polar climate as well as its seasonal variability, in terms of air temperature at 2m and wind speed. It has been demonstrated that NCEP and ERA40 reanalyses exhibit many similarities in the spatial pattern. Although, calculations of harmonic analysis revealed that these reanalyses are dominated by distinct

spatial seasonal variability. Comparison between the reanalyses and the IPCC results demonstrated substantial differences among these data. For instance, while CCCma and HADCM3 deliver negative temperature anomalies over the most part of the Antarctic continent as compared to ERA40, CCCSNIES and CSIRO are characterized by positive anomalies. Moreover, we found that the models fail to reproduce the spatial seasonal variability pattern as delivered by the reanalyses.

This present inaccuracies in the modeled temperature and wind under present day conditions, as well as the models disagreement in predicting the spatial and temporal distribution of the future polar climate in a high atmospheric CO₂ concentration environment,

raise crucial questions concerning about the models capability towards predictions of future Antarctic climate.