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Factors contributing to precipitation changes simulated by IPCC-AR4 models under the A1B scenario

Alexandre Laine^{1*}, Hisashi Nakamura¹, Kazuaki Nishii¹

¹EPS, University of Tokyo

Different processes can be responsible for mean precipitation changes under increased greenhouse gas conditions, including the direct effect of air temperature change on saturation vapor pressure, but also changes in surface evaporation, relative humidity and large-scale atmospheric circulation. In this study, we analyze precipitation changes simulated by the IPCC-AR4 models between the last two decades of the 21st and 20th centuries based on the A1B scenario. Using daily output, the climatological-mean moisture flux divergence and surface evaporation terms at every grid point are decomposed into contributions from the individual factors mentioned above, in order to assess their relative contributions and their seasonal and geographical dependency. Early results indicate that all the contributions are important for understanding mean precipitation changes in the models.

Keywords: precipitation changes, IPCC-AR4, modelling, intercomparison