



Modulation of the Southern Hemisphere climate by solar radiation management

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Geoengineering is increasingly being considered as a means to lessen the climatic impacts of anthropogenic greenhouse gas emissions. However, it is not without significant risks of its own. In this study, we investigate the response of the Southern Hemisphere (SH) climate to solar radiation management (SRM) using Geoengineering Model Intercomparison Project experiments G3 and G3solar. We find that the response to SRM is characterized by a contraction of the Hadley Cell and subtropical dry zones. This is accompanied by a shift towards a less positive state of the Southern Annular Mode and a northward shift of the SH westerly winds, mitigating the trends under projected future anthropogenic forcing. These changes result in an increase in precipitation minus evaporation in the SH subtropics, suggesting that SRM may be effective at counteracting the anthropogenically-driven drying trend in this region. However, any beneficial impacts cease abruptly as soon as geoengineering is terminated.