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Southern Hemisphere jet stream: emergent constraints on future shift in zonally varying framework

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IPCC climate models (CMIP3/5) predict a poleward shift of the Southern Hemisphere (SH) jet stream under global warming, with a large spread across the models. Efforts to find emergent constraints for the future jet shift (response) have relied on the simulated present-day jet position (observable). However, this has been investigated primarily in a zonal-mean framework, which averages out important zonal asymmetries. In this study, we revisit the problem allowing for variations in the longitude, height and season of the response to gain a better physical understanding of the nature of the future jet shift in individual models. Results from a manual data analysis will help guide an exploration of the problem using a big data approach, in particular, the application of a genetic algorithm that finds optimal solutions based on iterative random selection within large sample data spaces.