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Polar atmospheric response to SST anomalies

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The response of the polar southern hemisphere atmosphere to a prescribed trend of oceanic equatorial temperature has been simulated to demonstrate a possible link between the progressive warming of tropical Sea Surface Temperature (SST) and Antarctic climate changes in the last decades. Model simulations produce an atmospheric response suggesting an influence of equatorial SST on polar dynamics, particularly during summer months, which projects strongly into the Southern Annular Mode (SAM) tendency. The dynamical mechanism, by which changes in tropical SSTs exert an influence on the upper latitude atmospheric dynamics, is investigated. The analysis of the simulation results seems to highlights a large-scale perturbation of atmospheric circulation driven by the SST perturbation, affecting tropical convective activity and wave forcing. In particular, the introduction of the SST perturbation seems to generate a strong vertical wind shear at middle latitude from September-October, altering the propagation of large-scale planetary waves.