



An Idealised Climate Sensitivity Study Assessing the Impact of Future CO₂ Concentrations and SSTs on the Brewer-Dobson Circulation

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The sensitivity of the Brewer-Dobson circulation to changes in background CO₂ concentrations and sea surface temperatures (SSTs) is assessed via a series of time-slice integrations using the Met Office Unified Model with parameterised stratospheric chemistry. Previous work by these authors found a CO₂-related response in stratospheric ozone and dynamics in the northern hemisphere high latitudes. This study aims to quantify changes in meridional overturning and tropical upwelling assuming a doubling of CO₂. Stratospheric geopotential height and streamfunction patterns are compared between time-slice integrations using either present-day SSTs or those for the late 21st century, as projected by the coupled ocean-atmosphere model HadCM3. This approach allows the relative importance of CO₂ and SST changes, in modifying the meridional transport of ozone from the source region to middle and high latitudes, to be determined.