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全球化学気候モデルによる２１世紀気候予測実験：ハロゲンおよび気候固定実験との比較
Simulations of 21st century climate using a chemistry-climate model: Comparison with fixed-halogen and -climate runs

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Future changes in wave forcing and transport characteristics of the middle atmosphere are examined using multidecadal simulations carried out with a chemistry-climate model (CCM) developed at the Meteorological Research Institute (MRI-CCM). First, we conducted a control experiment through the 21st century under the forcing prescribed according to the CCM Validation Activity (CCMVal-2) for SPARC REF2 scenario, in which both the greenhouse gas (GHG) and ozone depleting substance (ODS) forcings vary transiently in time. In the control experiment, subtropical wave forcing strengthens in the lower stratosphere especially in both summer hemispheres. However, wave forcing over the Antarctic is decreased in spring and summer as a result of an earlier breakdown of the polar vortex in the future period. Next, we conducted two sensitivity experiments in which either GHGs or ODSs are held fixed at 1960 levels, while the other forcing varies transiently as in the control experiment. Comparing the two sensitivity experiments with the control experiment, the relative impacts of the ODS and GHG forcings on the climate of the middle atmosphere are evaluated through 21st century.