

**Supplemental Information for “Climate, variability, and climate sensitivity of “Middle Atmosphere” chemistry configurations of the Community Earth System Model Version 2, Whole Atmosphere Community Climate Model Version 6 (CESM2(WACCM6))”**

N. A. Davis<sup>1</sup>, D. Visioni<sup>2</sup>, R. R. Garcia<sup>1</sup>, D. E. Kinnison<sup>1</sup> D. R. Marsh<sup>3</sup>, M. Mills<sup>1</sup>, J. H. Richter<sup>3</sup>, S. Tilmes<sup>1</sup>, C. G. Bardeen<sup>1</sup>, A. Gettelman<sup>4</sup>, A. A. Glanville<sup>3</sup>, D. G. MacMartin<sup>2</sup>, A. K. Smith<sup>1</sup>, F. Vitt<sup>1,5</sup>

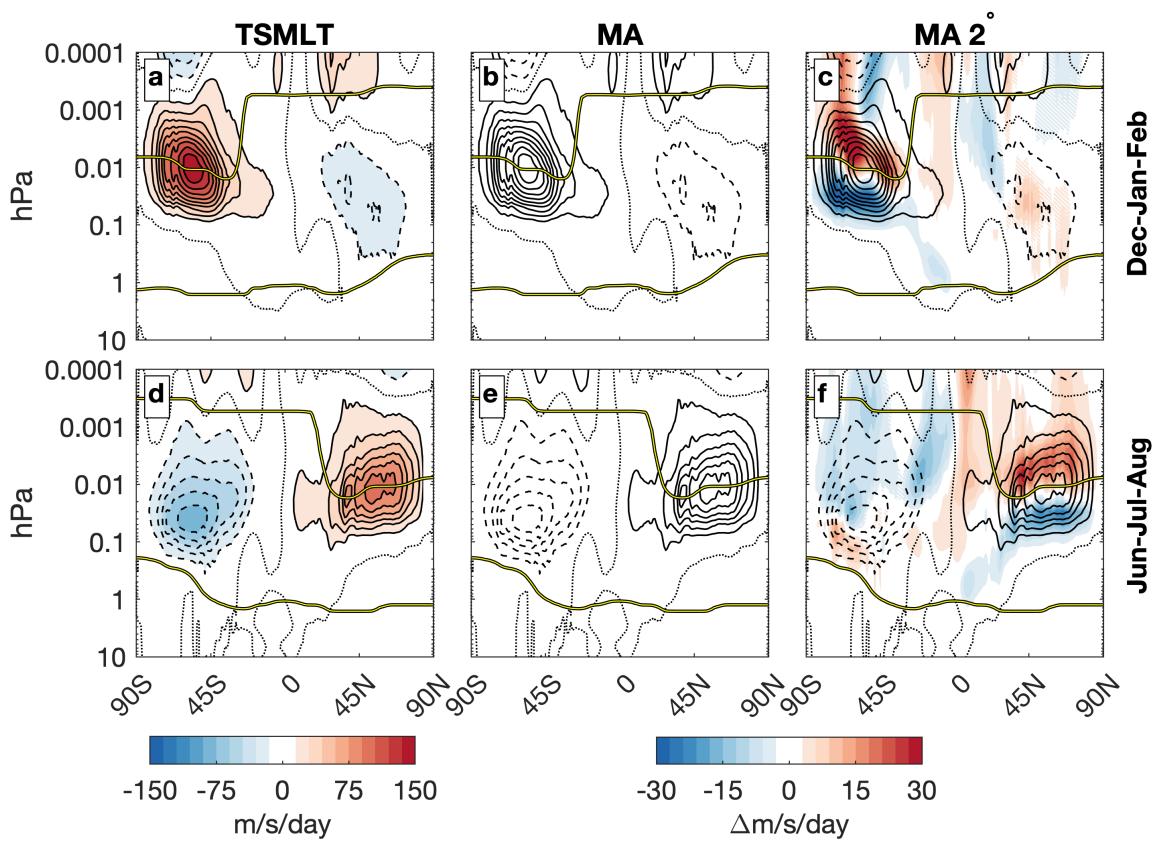
<sup>1</sup>Atmospheric Chemistry and Modeling Observations Laboratory, National Center for Atmospheric Research, Boulder, CO, USA

<sup>2</sup>Sibley School of Mechanical and Aerospace Engineering, Cornell University, Ithaca, NY, USA

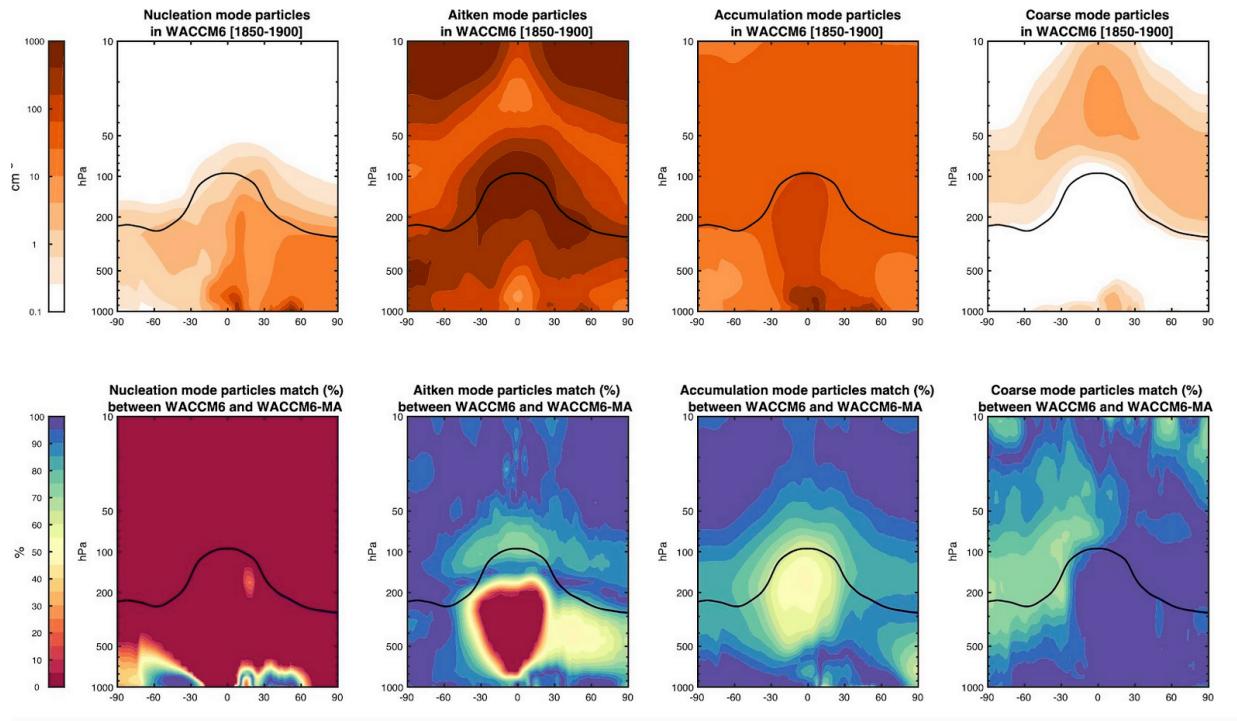
<sup>3</sup>Climate and Global Dynamics Laboratory, National Center for Atmospheric Research, Boulder, CO, USA

<sup>4</sup>Pacific Northwest National Laboratory, Richland, WA, USA

<sup>5</sup>High Altitude Observatory, National Center for Atmospheric Research, Boulder, CO, USA



**Figure S1:** Total parameterized gravity wave drag in (left column) the TSMLT configuration and (middle and right column) MA and MA 2° difference from the TSMLT configuration. Total drag shaded in a and d, and difference shaded in b, c, e, and f. Total drag from the TSMLT configuration is contoured in b, c, e, and f.



**Figure S2:** (Top row) number concentration of different aerosol sizes in the TSMLT configuration, and (bottom row) match between the number concentration in the TSMLT and MA configurations. See text for details.