Journal of Geophysical Research: Planets

Supporting Information for

Seasonal changes in the vertical structure of ozone in the Martian lower atmosphere and its relationship to water vapour.

K. S. Olsen[1], A. A. Fedorova[2], A. Trokhimovskiy[2], F. Montmessin[3], F. Lefèvre[3], O. Korablev[2], L. Baggio[3], F. Forget[4], E. Millour[4], A. Bierjon[4], J. Alday[1,5], C. F. Wilson[1,6], P. G. J. Irwin[1], D. A. Belyaev[2], A. Patrakeev[2], and A. Shakun[2]

[1]Department of Physics, University of Oxford, Oxford, UK.

[2]Space Research Institute (IKI), Moscow, Russia.

[3]Laboratoire Atmosphères, Milieux, Observations Spatiales (LATMOS/CNRS), Paris, France.

[4]Laboratoire de Météorologie Dynamique (LMD/CNRS), Paris, France.

[5]School of Physical Sciences, The Open University, Milton Keynes, UK.

[6]European Space Research and Technology Centre (ESTEC), Noordwijk, Netherlands

Contents of this file

Figures S1 to S5

Introduction

This supporting information for **Seasonal changes in the vertical structure of ozone in the Martian lower atmosphere and its relationship to water vapour** contains the supplementary figures S1 to S5. S1 shows changes in latitude of ACS MIR solar occultation observations over time (L_s). A colour scale provides local true solar times. S2 is the same as Figure 2, but using data from the LMD GCM for comparison. Figure S3 is the same as Figure 4, but using colours indicating latitude rather than solar longitude. Figures S4 and S5 show the data presented in Figures 11**c**, **f** and 12**c**, **f**, respectively with colour schemes representing local time, latitude, and altitude.

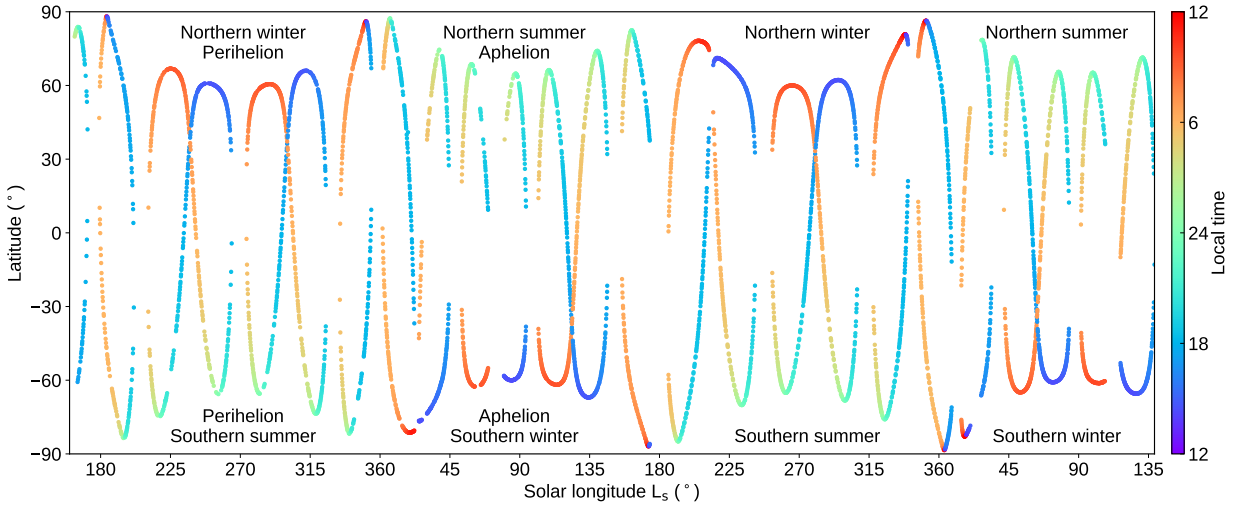

Figure S1. Changes in the latitudes of ACS MIR solar occultation measurements over time from the mission start in MY 34 (L_s = 163°), through MY 35, and into MY 36. Colours indicate local time. (Note that O_3 data presented here go up to L_s = 90° in MY 36, and ACS NIR temperature data extend to L_s = 10° in MY 36).

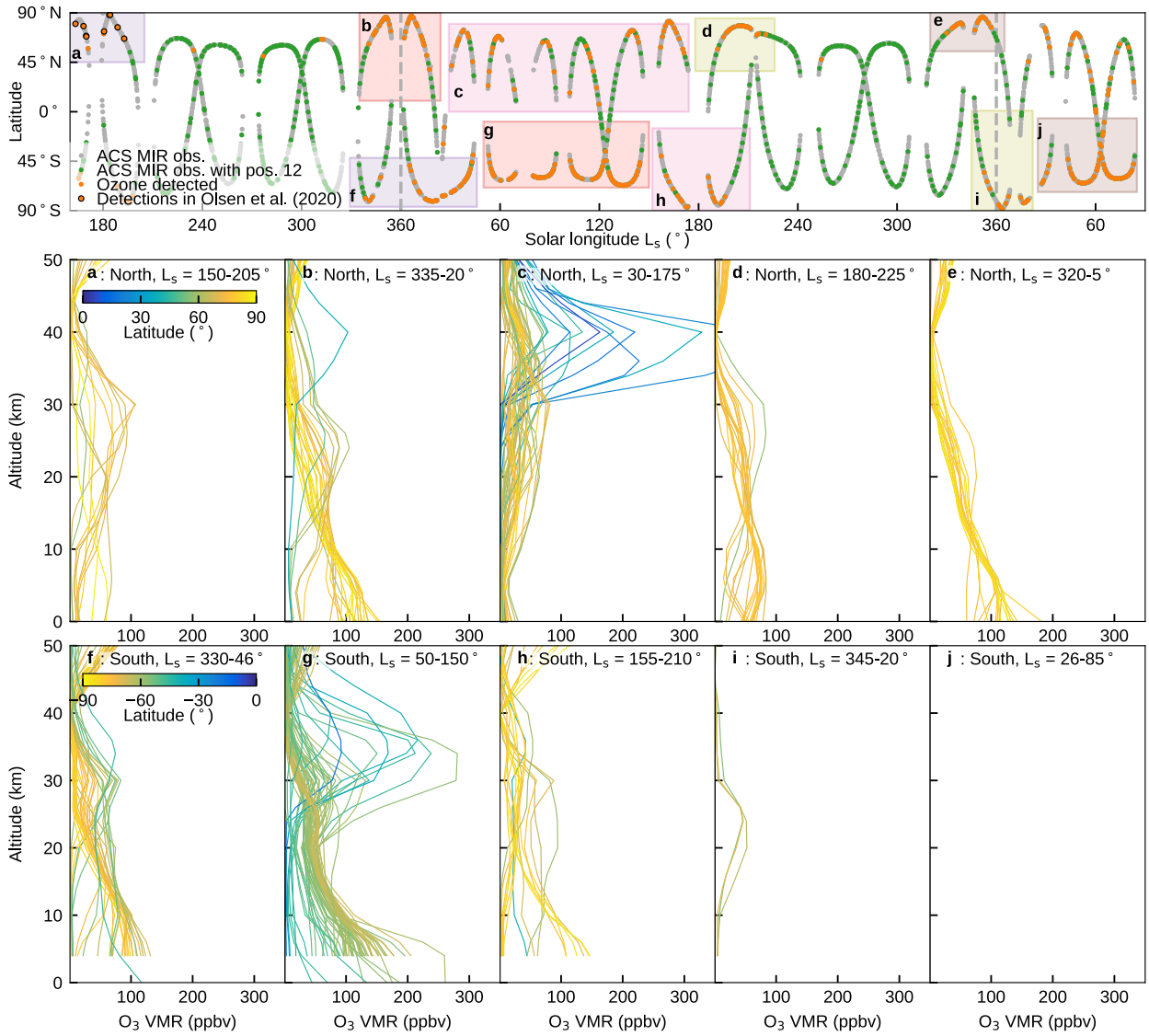

Figure S2. Vertical profiles of ozone VMR computed by the LMD GCM for comparison with ACS MIR observations. Model data is extracted for local times, L_s, and latitudes of ACS MIR solar occultation and organised as in Figure 2. Note that GCM data is only available up to the end of MY 35.

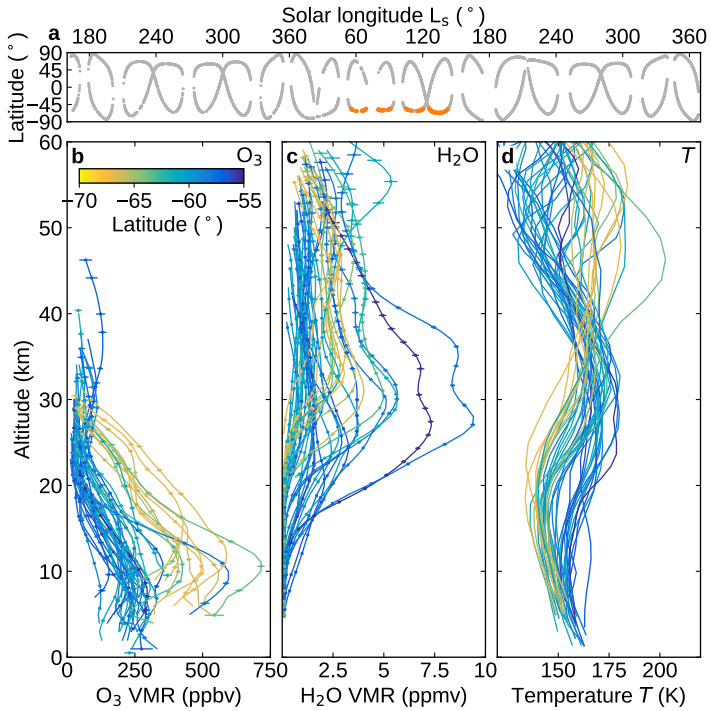

Figure S3. Ozone observations during the aphelion period. As in Figure 4 but coloured using latitudes rather than L_s. These profiles were measured at middle southern latitudes (55°S-66°S) during the aphelion period (southern winter) and correspond to Figures 2**g**.

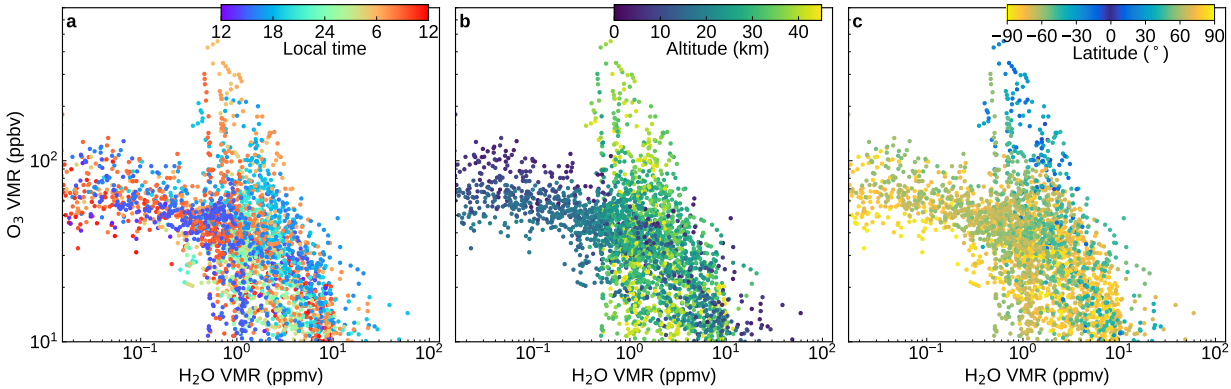

Figure S4. Data from Figure 11**c** and **f** coloured using: local time (panel **a**), altitude (panel **b**), and latitude (panel **c**).

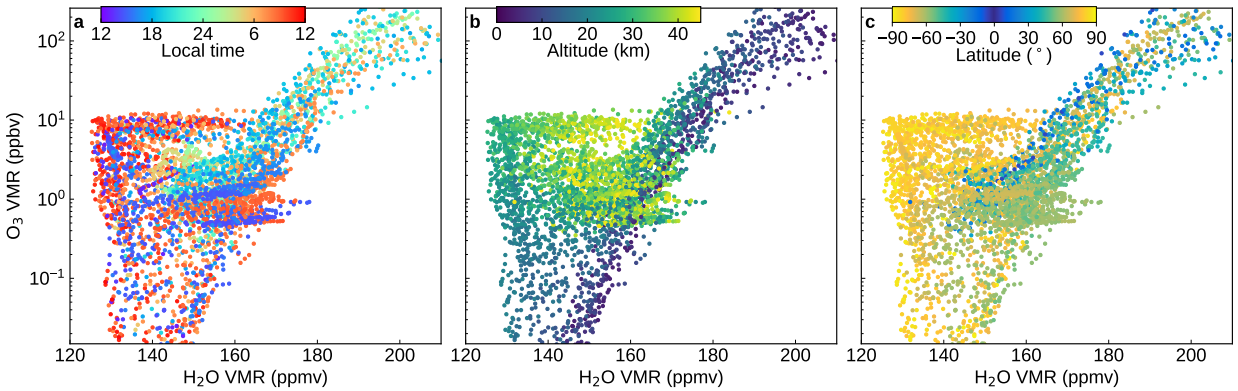

Figure S5. Data from Figure 12**c** coloured using: local time (panel **a**), altitude (panel **b**), and latitude (panel **c**).