

Supporting Information for ”Initial results of the relative humidity observations by MEDA instrument onboard the Mars 2020 Perseverance Rover”

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Contents of this file

1. Text S1
2. Figures S1 to S4

Introduction Additional figures are presented here to show more details of diurnal humidity cycles observed, some interesting phenomena and differences between the observational modes.

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Text S1. Additional figures are presented here to show differences between HRIM and CM modes, more details of diurnal humidity cycles observed and some interesting phenomena.

Figure S1 shows VMR seasonal observations per sol (nighttime min/max values) for sols 80-410 both in HRIM mode alone and in both HRIM and CM modes. Differences between the values follow from observational cadences of the modes which have distributed differently, not so much of the small calibration level difference between the modes.

Figure S2 shows diurnal cycles in more detail. Plotting diurnal VMR cycle for the HRIM modes only would give insufficient view of the cycles as there has been less HRIM observations in the early night hours than more close to morning.

Figure S3 shows, how in the morning, sol 330 VMR drops for an hour after sunrise while it should generally begin rising as warming should release water vapor from ground. This phenomenon is seen in many sols. Figure S4 shows the same feature in HRIM mode in the morning sol 362.

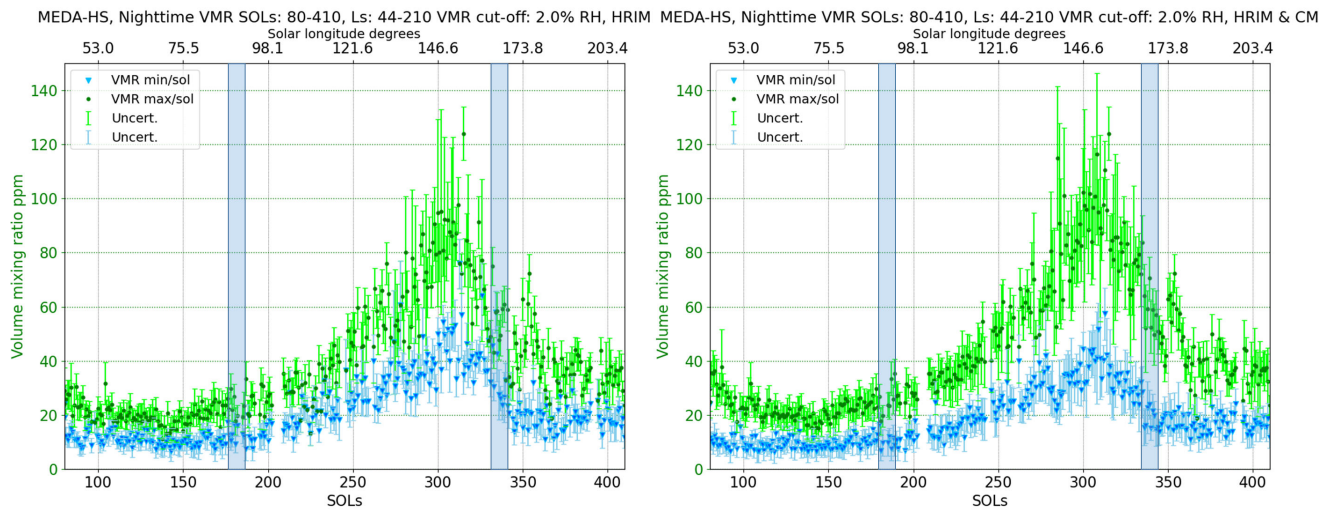


Figure S1. Left. VMR min/max values per sol, using only HRIM observations (the same figure as in the main article). Right. Same as left, but using both HRIM- and CM-mode observations. Shaded areas show regenerations in the sols 180 and 335 and 10 sols afterwards which maybe compromised after regeneration

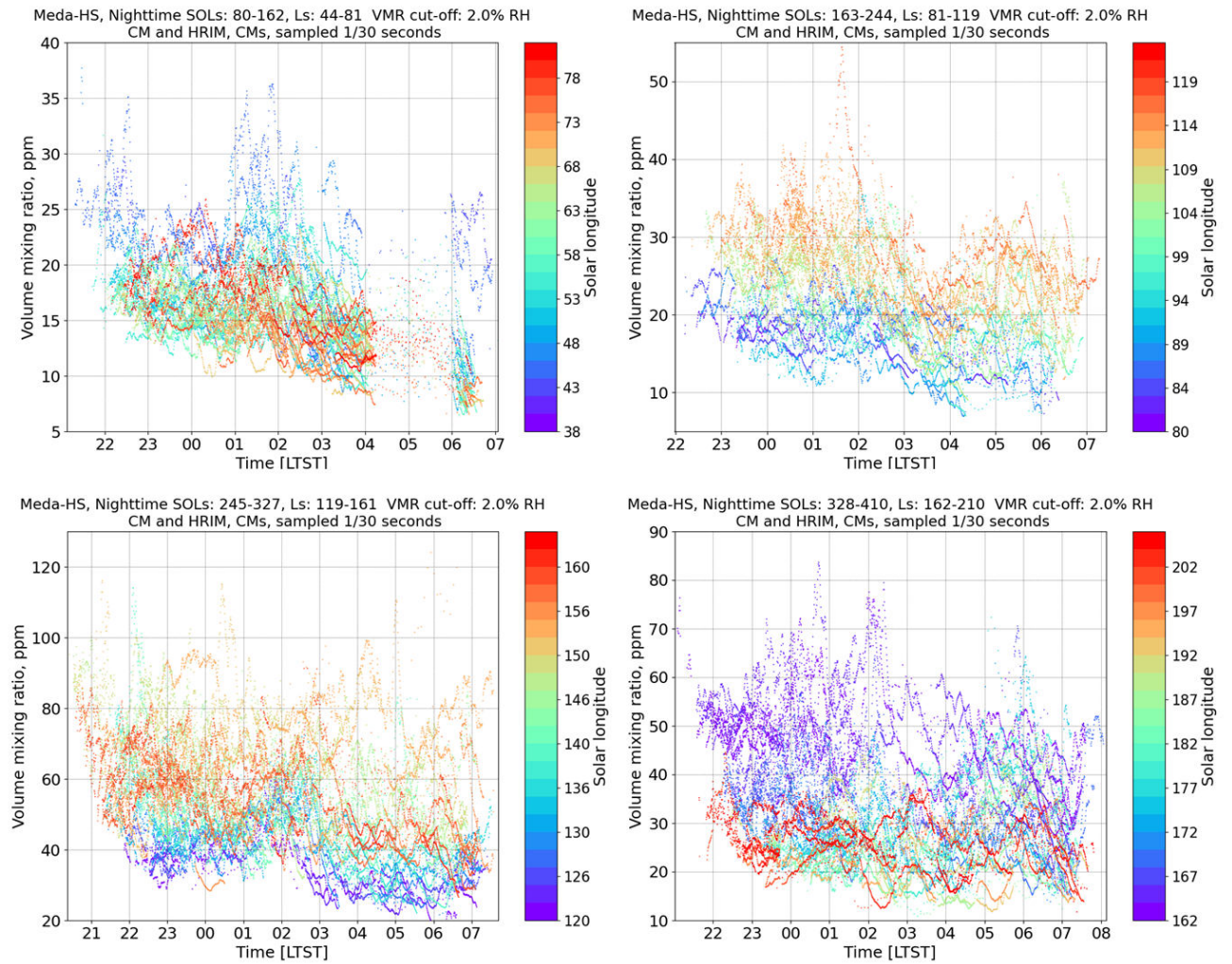


Figure S2. Diurnal cycles of nighttime VMRs in detail.

MEDA, Night Sols: 329-330, P. ave: 630.0Pa, Ls: 162.1 vmr cut-off:2.0%Rh ATS sm mav=450
 Sunrise: 05:49 LTST
 SOLs

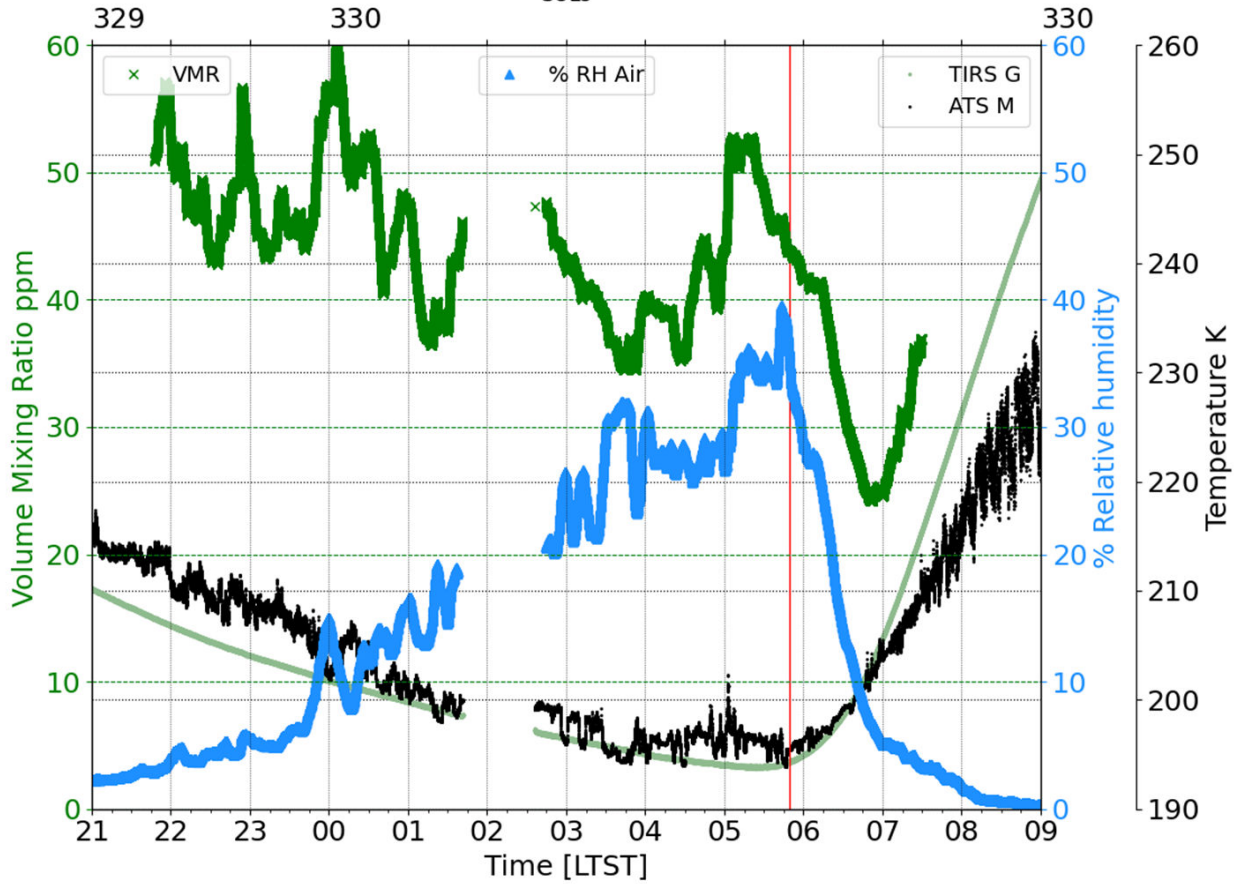


Figure S3. Night sol329/330: Temperature is ATS single value (black), Rh (blue) is in air stream (referred to ATS single value). Fluctuations in ATS data coincide with stronger VMR changes. The VMR also drops here almost one hour after sunrise.

MEDA, Night Sols: 361-362, P. ave: 655.0Pa, Ls: 180.1 vmr cut-off:2.0%Rh ATS sm mav=450
 Sunrise: 06:00 LTST
 SOLs

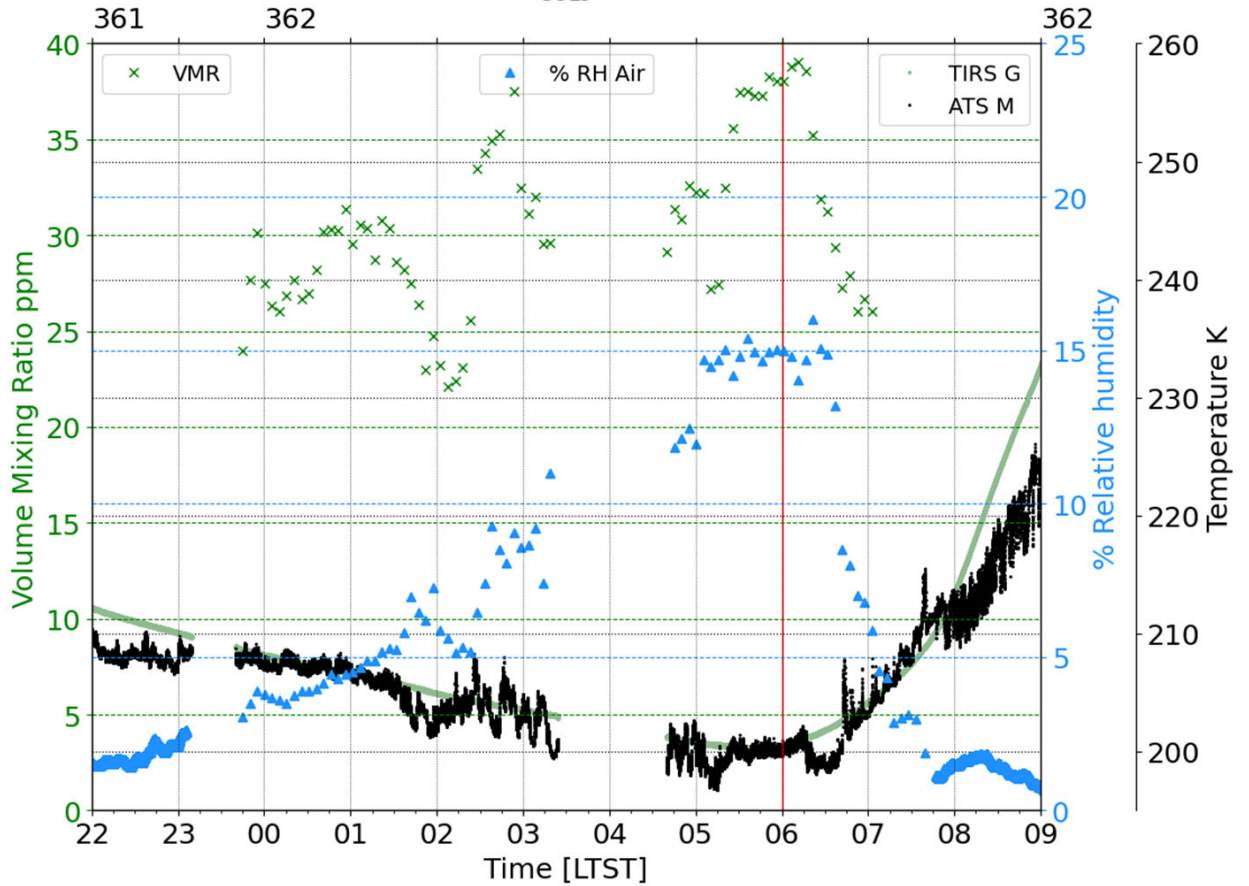


Figure S4. Night sol361/362: Temperature is ATS single value (black), Rh (blue) is in air stream (referred to ATS single value). The VMR also drops here almost one hour after sunrise.