

Supporting Information for “EMM EMUS Observations of Hot Oxygen Corona at Mars: Radial Distribution and Temporal Variability”

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Contents of this file

1. Data coverage
2. Hydrogen Lyman alpha wing subtraction from OI 130.4 nm

3. Figures S1 to S4

Data coverage

Figure S1 shows the sky coverage of the foreground (Figure S1a) and background (Figure S1b) observations in celestial coordinates; that is, in Right Ascension (RA) and Declination (Dec). Both foreground and background observations are made by pointing the instrument at the same part of the sky.

Figure S2 shows the data coverage during the period of study (2021-04-26 to 2023-02-28). Figure S2a shows the tangent altitude coverage, Figure S2b shows the solar zenith angle coverage, Figure S2c shows the variation in Sun–Mars distance, and Figure S2d and Figure S2e show the variation in right ascension and declination, respectively, in equatorial sky coordinates.

Figure S3 shows the geographic data coverage of OS4a observations. The colorbar shows the number of pixels in each bin of size 5 degree by 5 degree.

Hydrogen Lyman alpha wing subtraction from OI 130.4 nm

Figure S4 shows an example to demonstrate the baseline fitting method used for subtracting the hydrogen Lyman alpha wing under OI 130.4 nm emission. A second-degree polynomial is used to fit the H Lyman alpha line shape under the oxygen emission. This fit is subtracted from the original spectra to obtain the background subtracted spectra. This is done for each spatial bin (or pixel) and for all integrations of the foreground and interplanetary background spectra observations.

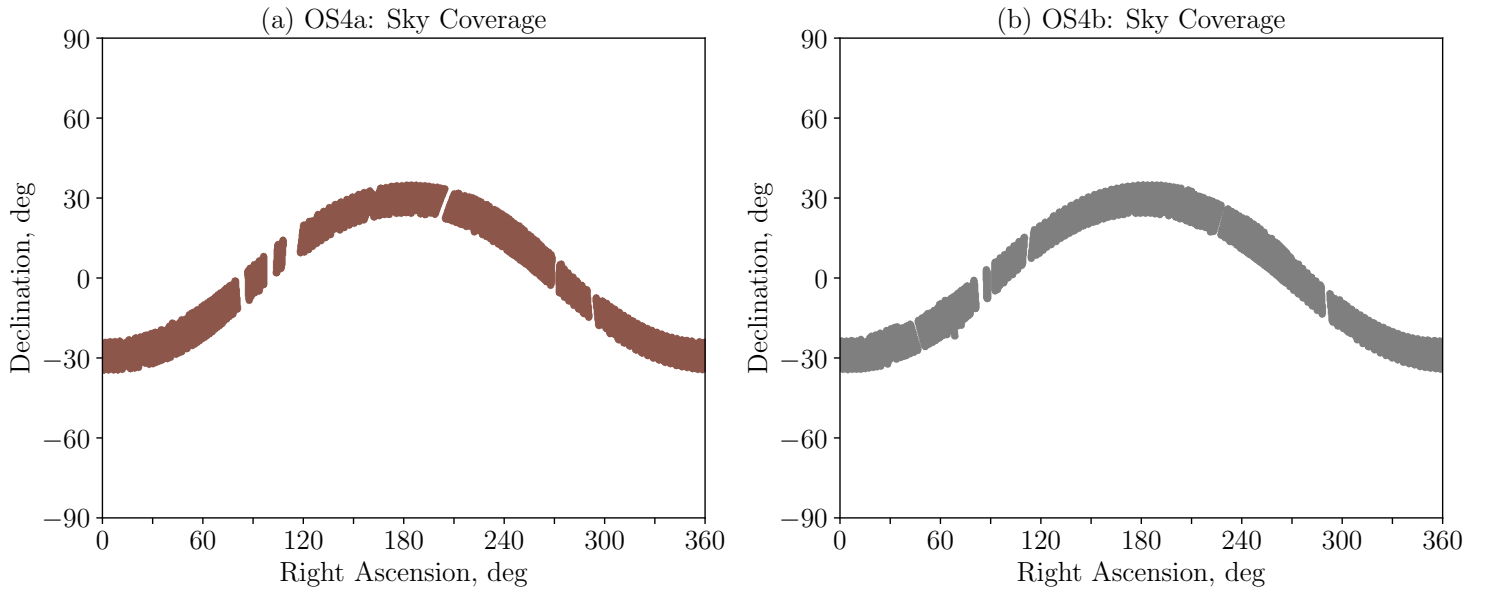


Figure S1. c) OS4a sky coverage, and d) OS4b sky coverage. The right ascension and declination are in equatorial sky coordinates.

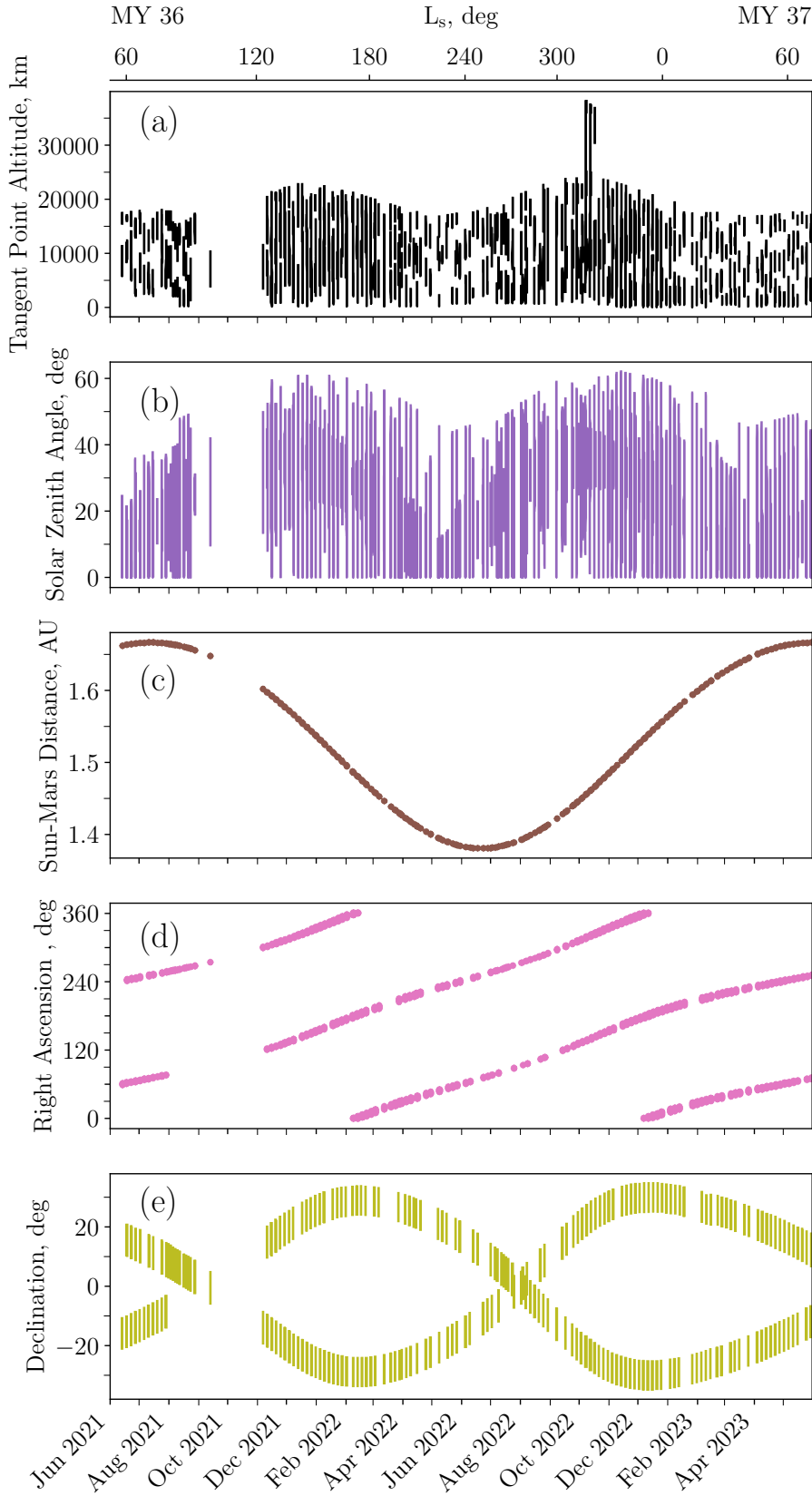


Figure S2. Foreground data coverage during the period of study: a) tangent altitude, b) solar zenith angle, c) Sun–Mars distance, d) right ascension, and e) declination.

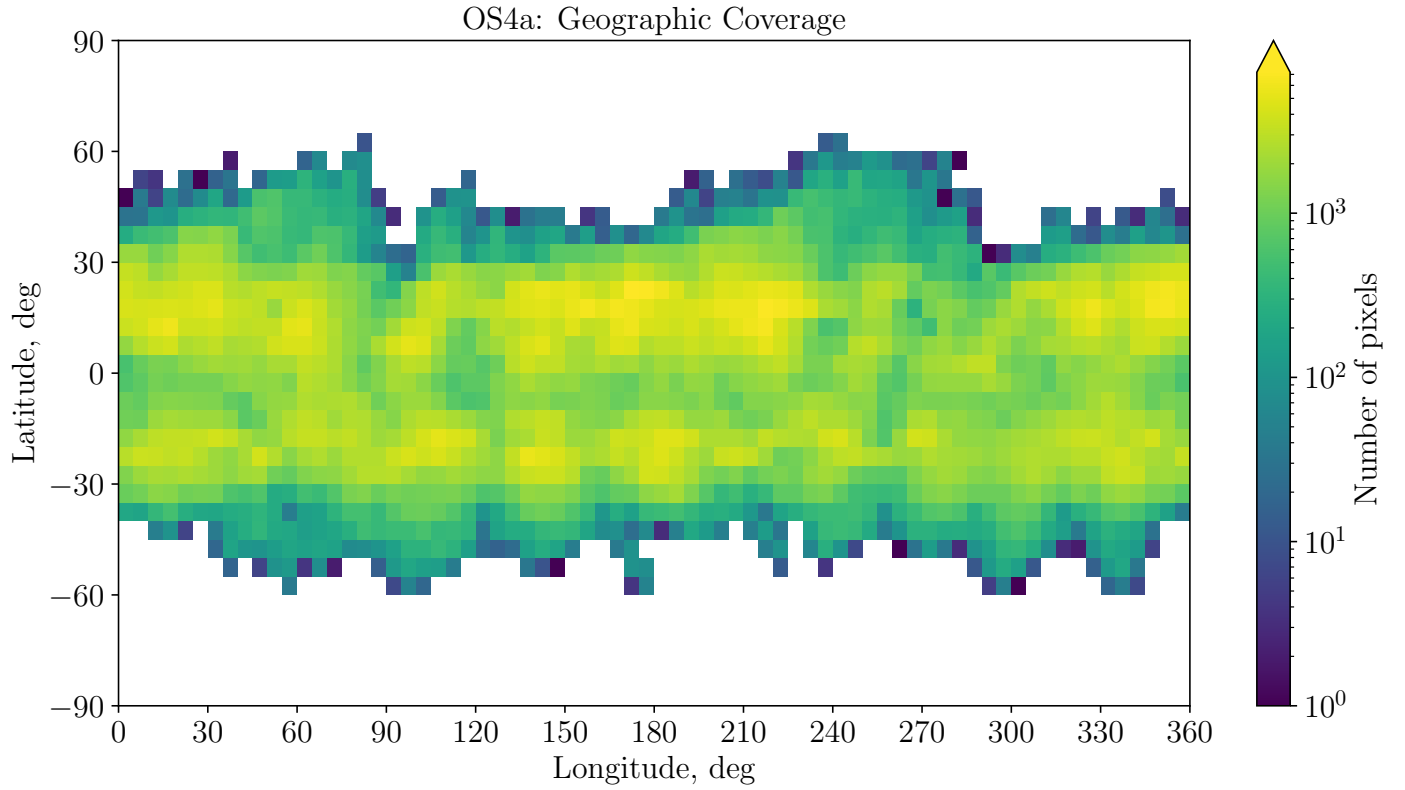


Figure S3. Geographic coverage of EMUS observations in longitude and latitude. Each geographic bin is 5 degree by 5 degree, and the colorbar shows the number of pixels in each bin.

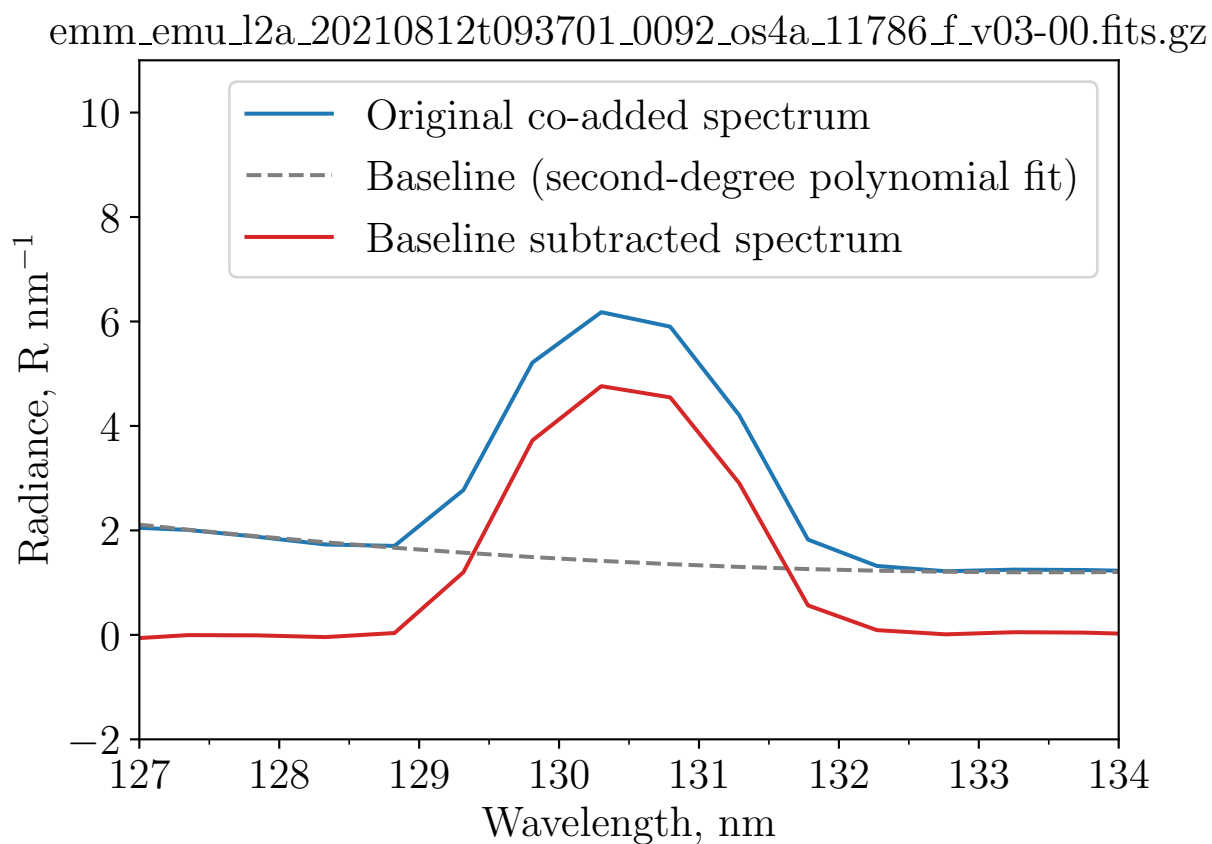


Figure S4. Example illustrating the hydrogen Lyman alpha wing background subtraction method.