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Supplement of

Upper tropospheric CH$_4$ and CO affected by the South Asian summer monsoon during the Oxidation Mechanism Observations mission

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Table S1: Uncertainty for CO and CH₄ for all flights during OMO.

<table>
<thead>
<tr>
<th>flight no.</th>
<th>date</th>
<th>CO uncertainty [%]</th>
<th>CH₄ uncertainty [%]</th>
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<td>3.52</td>
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<td>3.47</td>
<td>0.34</td>
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<td>10</td>
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<td>3.23</td>
<td>0.33</td>
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<tr>
<td>11</td>
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<td>3.41</td>
<td>0.23</td>
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<td>19.42</td>
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<td>14</td>
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<td>4.08</td>
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</table>
Detailed overview of all OMO flights for p>300 hPa:

a) CO and CH$_4$ in situ and EMAC data along the flight track. The AMA is colour coded due to c[CH$_4$]$\geq$1879.8 ppb (yellow). Further the deviation between EMAC and in situ data are shown for CO and CH$_4$. Additionally, the flight altitude is in grey.

b) 204 hPa EMAC data for CO and wind field and in situ CO along the flight track. White contours represent CH$_4$ threshold and background values according to section 3.1.

c) 204 hPa EMAC data for CH$_4$ and wind field and in situ CH$_4$ along the flight track. White contours represent CH$_4$ threshold and background values according to section 3.1.

d) 10 day back centroid trajectories for 10 min releases along the flight track (black); colour coded is the altitude in hPa. Triangles are back trajectories for CH$_4$ mixing ratios above the CH$_4$ threshold and circles for below the CH$_4$ threshold.
Figure S1: Flight 08 (07.21.2015): transfer flight from Oberpfaffenhofen to Paphos. 
Figure S2: Flight 09 (07.25.2015): measurement flight from Paphos to Paphos over Cyprus.
Figure S3: Flight 10 (07.28.2015): measurement flight from Paphos to Paphos over Cyprus.
Figure S4: Flight 11 (08.01.2015): transfer flight from Paphos to Gan.
Figure S5: Flight 12/13 (08.06.2015): measurement flight from Gan to Bahrain and return to Gan.
Figure S6: Flight 14 (08.08.2015): measurement flight from Gan to Gan towards Sri Lanka.
Figure S7: Flight 15/16 (08.09.2015): measurement flight from Gan to Bahrain and return to Gan.
Figure S8: Flight 17/18 (08.10.2015): transfer flight from Gan to Paphos via refuelling stop in Bahrain.
Figure S9: Flight 19 (08.13.2015): measurement flight from Paphos to Paphos towards Oman.
a) Graph showing the concentration of CH₄ and CO over time.

b) Map with wind vectors and isobars at a pressure of 204 hPa.
Figure S10: Flight 20 (08.15.2015): measurement flight from Paphos to Paphos towards Oman.
Figure S11: Flight 21 (08.18.2015): measurement flight from Paphos to Paphos towards Oman.
Figure S12: Flight 22 (08.23.2015): measurement flight from Paphos to Paphos over Egypt, Greece, the Mediterranean; with profiles over Egypt.
a) [Graph showing time series of CH₄ and CO concentrations with markers for different concentrations.]

b) [Map showing CO concentrations at 204 hPa with contour lines and vector fields.]
Figure S13: Flight 23 (08.25.2015): measurement flight from Paphos to Paphos over Egypt, Etna, the Mediterranean; with profiles over Egypt and low altitude at the Etna.
Figure S14: Flight 24 (08.27.2015): transfer flight from Paphos to Oberpfaffenhofen via Etna with low altitude.