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2 **Supplementary Material to**

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4 **Mass-spectrometric identification of primary biological particle markers: indication for**
5 **low abundance of primary biological material in the pristine submicron aerosol of**
6 **Amazonia**

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20 **Details on the evaluation of AMS data from the AMAZE field campaign**

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22 **1 Modifications made to fragmentation table (SQUIRREL v1.49)**

23 Gas phase correction derived from blank measurements:

24 $\text{frag_air}[29] = 0.845 * 0.00736 * \text{frag_air}[28]$

25 $\text{frag_CO2}[44] = 0.83 * 0.00037 * 1.36 * 1.28 * 1.14 * \text{frag_air}[28]$

26 $\text{frag_RH}[18] = 0.8 * 0.01 * \text{frag_air}[28]$

27 frag_O16[16] = 1.10 * 0.353 * frag_air[14]

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29 Changes to account for the high contribution of organic nitrates:

30 frag_nitrate[46] = 46,

31 frag_nitrate[30] = 2* frag_nitrate[46],

32 frag_organic[30] = 30,-frag_nitrate[30],-frag_air[30]

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34 This is based on the following assumptions: m/z 46 is only due to NO_2^+ from inorganic nitrate,
35 the ratio of m/z 30 to m/z 46 is 2:1 for inorganic ammonium nitrate (Allan et al., 2003;
36 Hogrefe et al., 2004), and therefore the rest of m/z 30 is due to organic nitrate or other organic
37 ions (as CH_4N^+ and CH_2O^+). The high-resolution data (12 h averages) show that between 20
38 and 60% (on average 35%) of m/z 30 is due to NO^+ (see Figure S1, lower panel).

39 For the calculation of the mass concentration standard relative ionization efficiencies were
40 used (nitrate: 1.1; sulfate: 1.2; organics: 1.4, ammonium: 4; chloride: 1.3). The applied
41 collection efficiency (CE) was 1.0, which is consistent with the intercomparisons with other
42 instruments and the liquid character of the submicron particles (see Chen et al., (2009)

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44 **2 Contributions of the marker m/z to the UMR mass peaks:**

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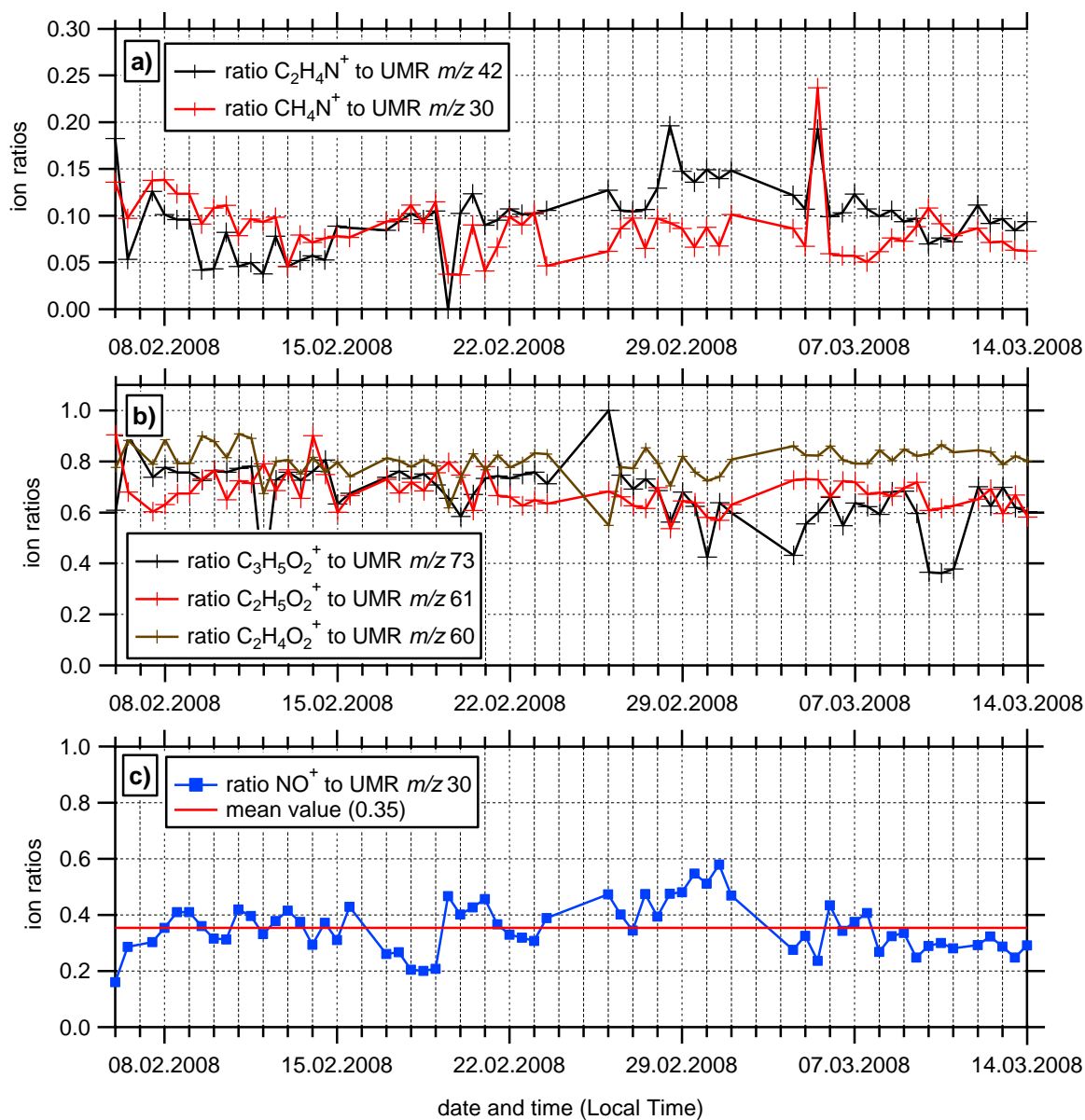
46 Figure S1 shows the ratios of the marker peak intensities to the respective UMR peak (m/z 30
47 and 42 for amino acids, upper panel (a); m/z 60, 61, and 73 for carbohydrates, middle panel,
48 (b)). The lower panel (c) shows the ratio of NO^+ to the UMR peak at m/z 30.

49 Figure S2 shows the high resolution peak fitting for m/z 30 and 42 for the examples for March
50 05, 12 h (local time), when the amino acid markers showed maximum values.

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53 **Supplementary Figures**



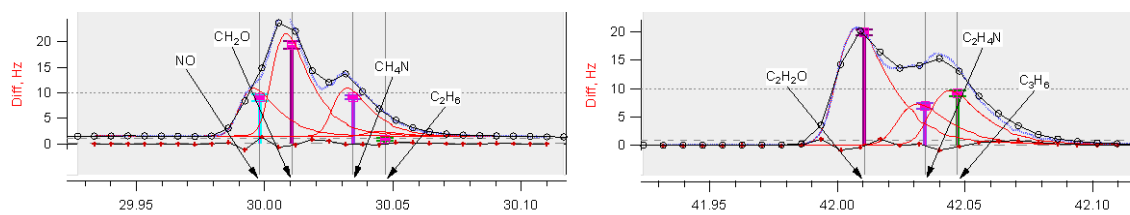
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55 Figure S1. Fraction of marker peaks to the total UMR peak at the nominal m/z ratio measured
56 during AMAZE-08. a) amino acid markers, b) carbohydrate markers, c) fraction of NO^+ to
57 UMR m/z 30.

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62 Figure S2. High resolution peak at m/z 30 and m/z 42 from March 05, 2008, 12 h (local time).

63 During this time period CH_4N^+ and $\text{C}_2\text{H}_4\text{N}^+$ contribute significantly more to the respective

64 UMR peak than during other times.

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