Supplementary Materials:
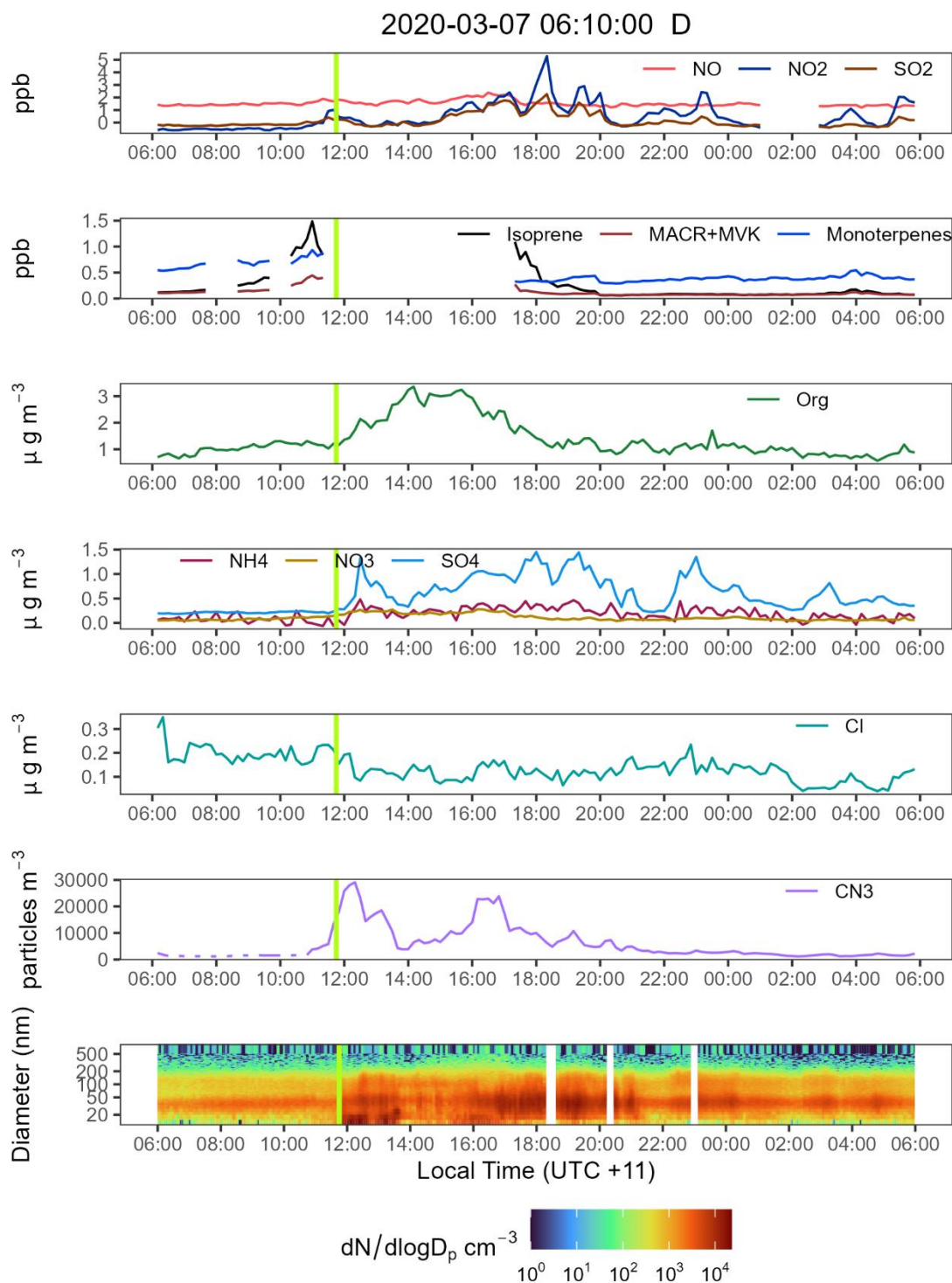
Figure S1: Time series of all selected variables during the NPF event during 2020-03-07. NO = Nitric oxide, NO2 = Nitrogen dioxide, SO2 = Sulphur dioxide, MACR+MVK = isoprene ox. products methacrolein and methyl-vinyl-ketone, Org = Organic mass fraction, NH4 = Ammonium mass fraction, NO3 = Nitrates mass fraction, SO4 = Sulphates mass fraction, Cl = Chloride mass fraction, CN3 = Condensation Nuclei >3nm. The light green vertical line marks the NPF approximated starting time of the event. Note how the multiple peaks of SO2 and NO2 between 16:00 to 20:00 induce as increase in particle density on the nucleation mode at 16:00 and then at multiple points on the Aitken mode.
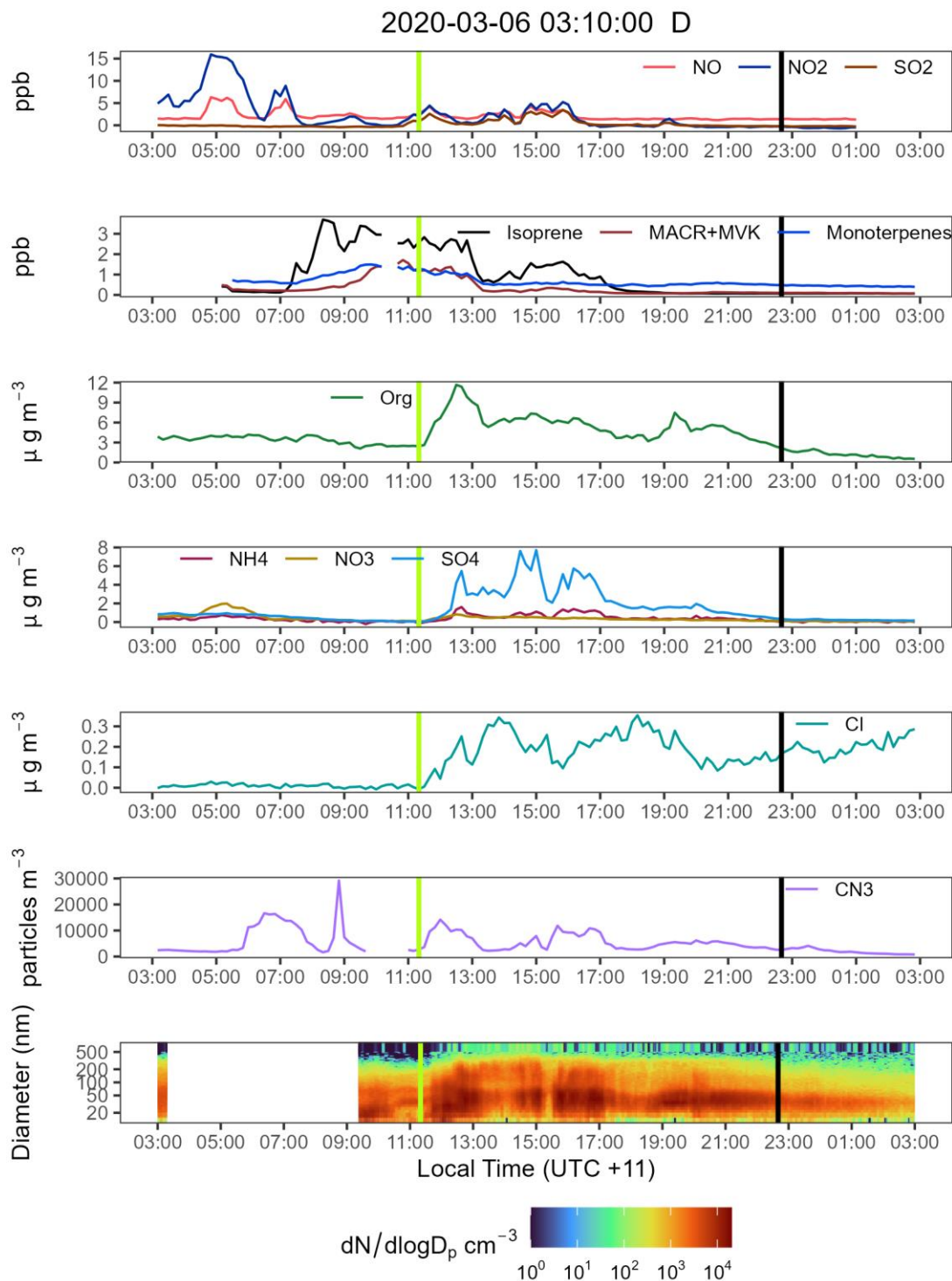
Figure S2: The light green vertical line marks the NPF approximated starting time of the event. NO = Nitric oxide, NO2 = Nitrogen dioxide, SO2 = Sulphur dioxide, MACR+MVK = isoprene ox. products methacrolein and methyl-vinyl-ketone, Org = Organic mass fraction, NH4 = Ammonium mass fraction, NO3 = Nitrates mass fraction, SO4 = Sulphates mass fraction, Cl = Chloride mass fraction, CN3 = Condensation Nuclei >3nm. The black line represents the NPF approximated ending time. Time series of all selected variables during the NPF event during 2020-03-06. Note how the SO_2 increments (around 5:00 and 12:00) are followed by an enhancement in aerosols mass (13:00) and CN_3 (6:00 and 12:00).
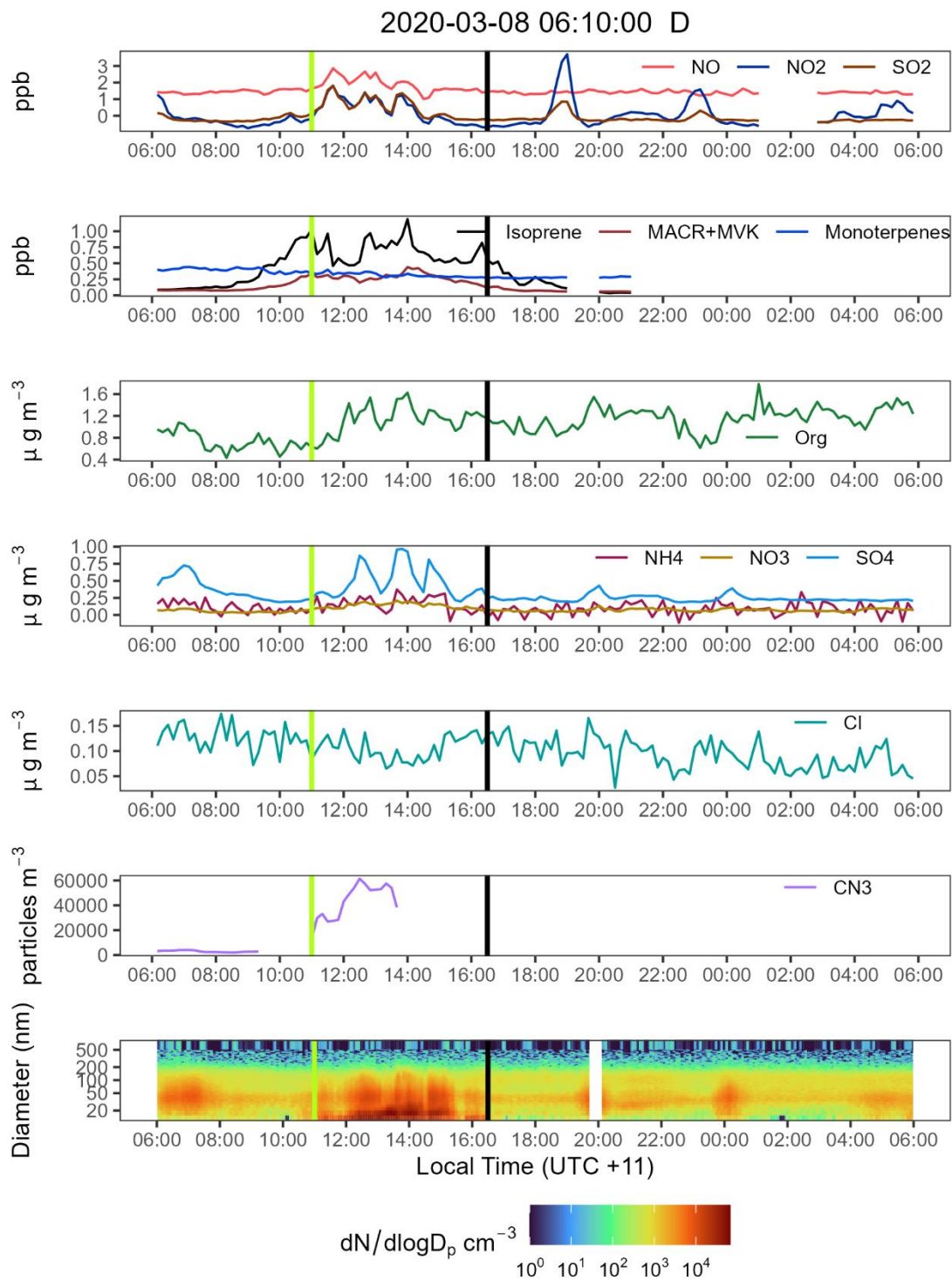
Figure S3: Time series of all selected variables during the NPF event during 2020-03-08. . NO = Nitric oxide, NO2 = Nitrogen dioxide, SO2 = Sulphur dioxide, MACR+MVK = isoprene ox. products methacrolein and methyl-vinyl-ketone, Org = Organic mass fraction, NH4 = Ammonium mass fraction, NO3 = Nitrates mass fraction, SO4 = Sulphates mass fraction, Cl = Chloride mass fraction, CN3 = Condensation Nuclei >3nm. Note how the aerosol mass and density do not increase as previously described in other events.
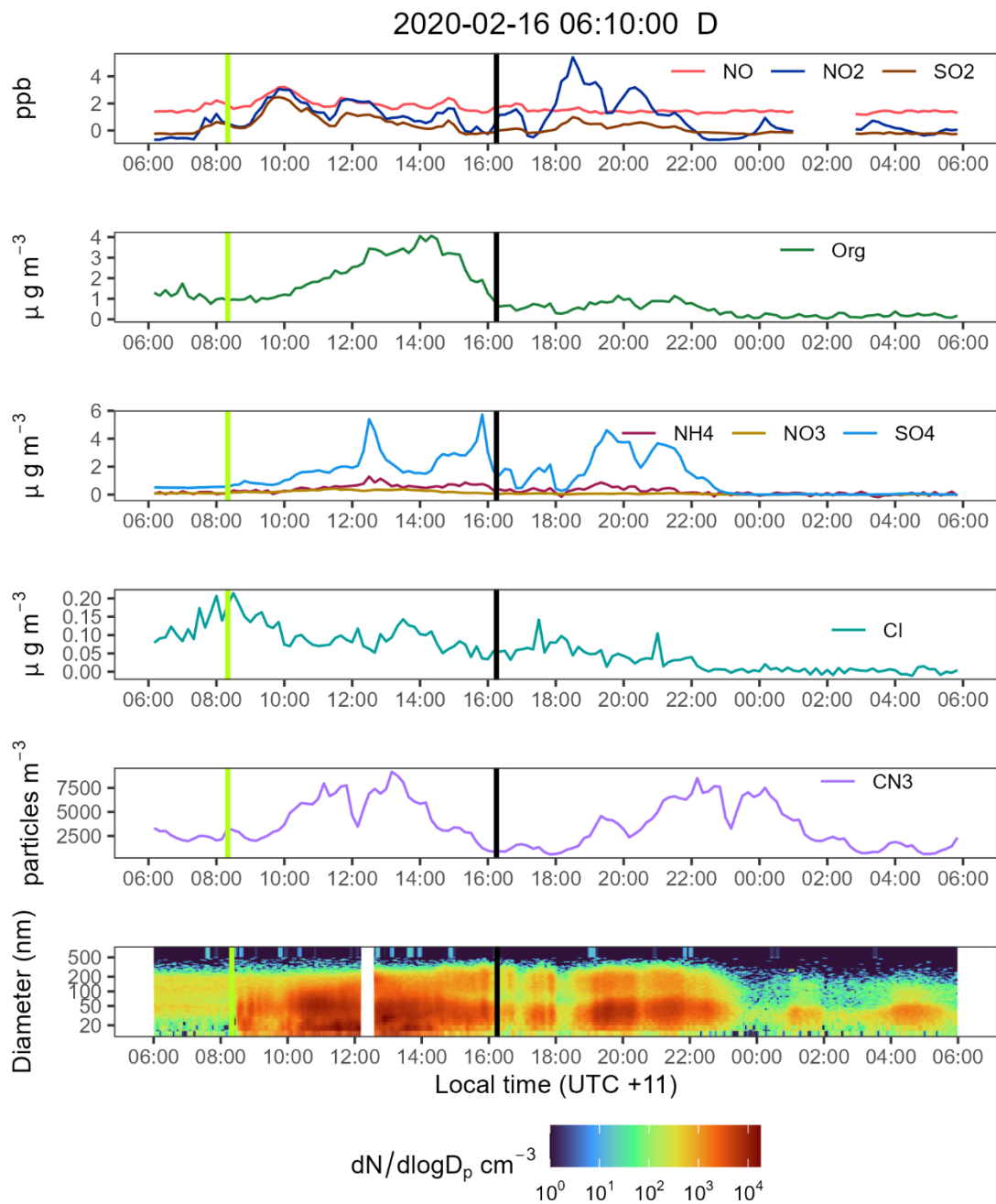
Figure S4: Time series of all selected variables during the NPF event during 2020-02-16. NO = Nitric oxide, NO2 = Nitrogen dioxide, SO2 = Sulphur dioxide, MACR+MVK = isoprene ox. products methacrolein and methyl-vinyl-ketone, Org = Organic mass fraction, NH4 = Ammonium mass fraction, NO3 = Nitrates mass fraction, SO4 = Sulphates mass fraction, Cl = Chloride mass fraction, CN3 = Condensation Nuclei >3nm. Note how the multiple peaks of SO_2 and NO_2 resemble the SO_4 pattern.
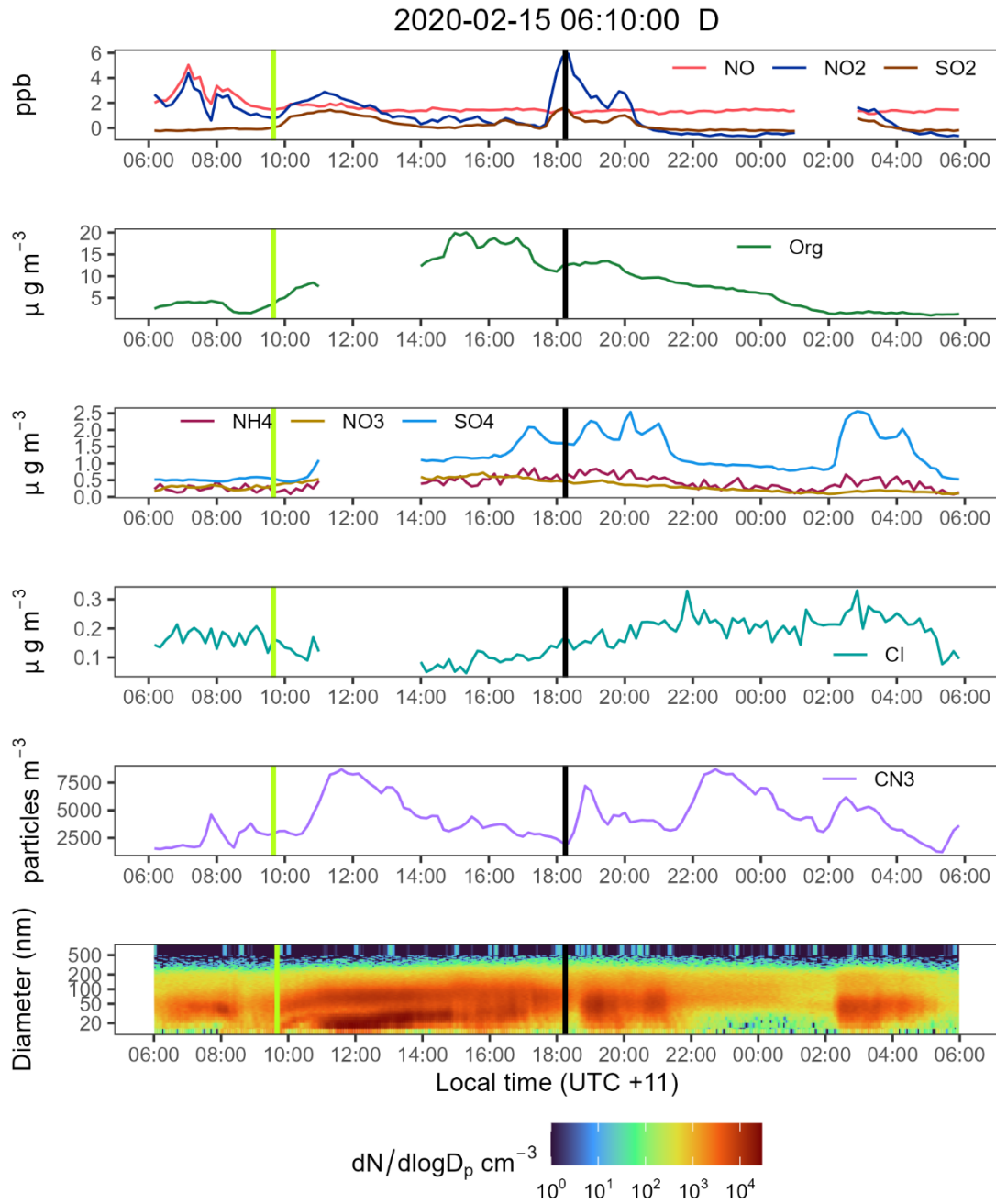
Figure S5: Time series of all selected variables during the NPF event during 2020-02-15. . NO = Nitric oxide, NO2 = Nitrogen dioxide, SO2 = Sulphur dioxide, MACR+MVK = isoprene ox. products methacrolein and methyl-vinyl-ketone, Org = Organic mass fraction, NH4 = Ammonium mass fraction, NO3 = Nitrates mass fraction, SO4 = Sulphates mass fraction, Cl = Chloride mass fraction, CN3 = Condensation Nuclei >3nm.
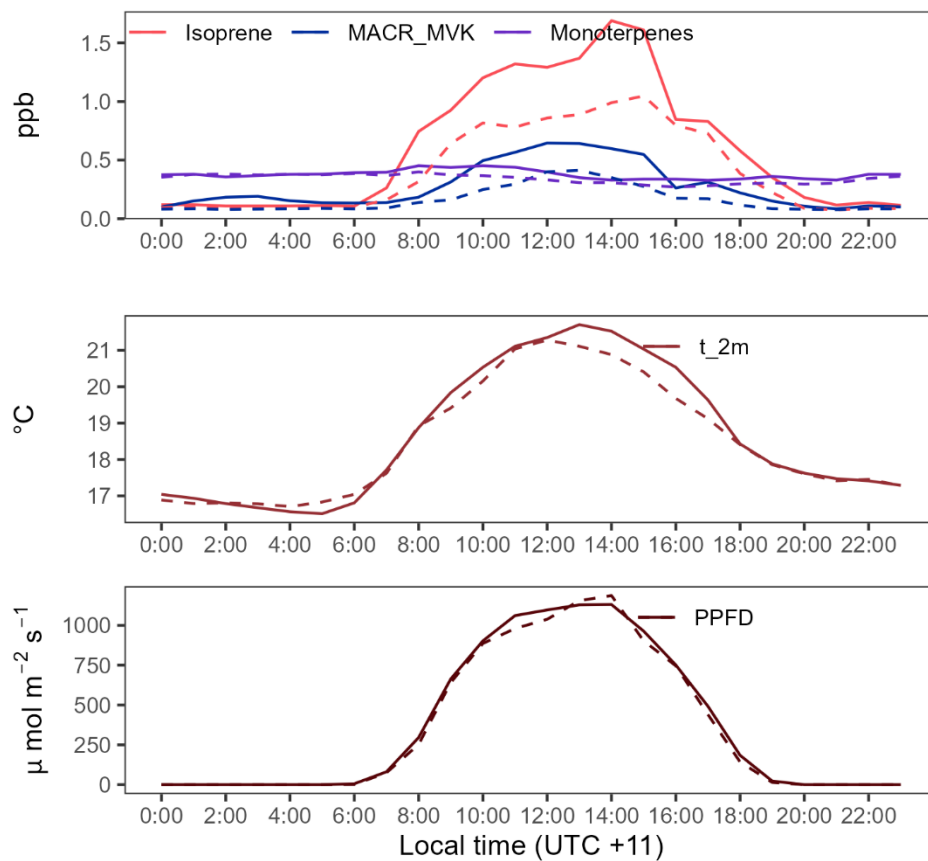
Figure S6: Hourly averages of biogenic VOCs, temperature and PAR (PPFD) for the campaign period. The lines are the mean values per hour and the dashes are the median values per hour.
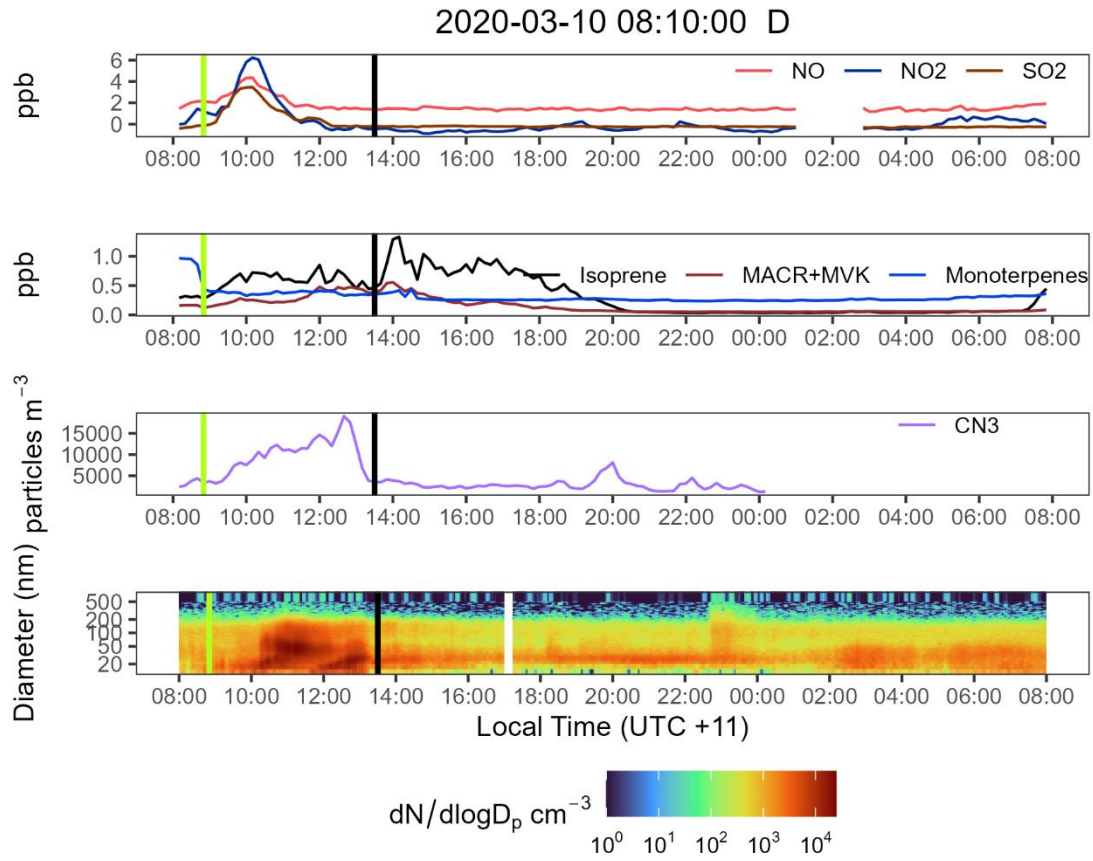
Figure S7: Time series of all selected variables during the NPF event during 2020-03-10. The drop of CN_3 seem related to the lack of SO_2 after 11:00.
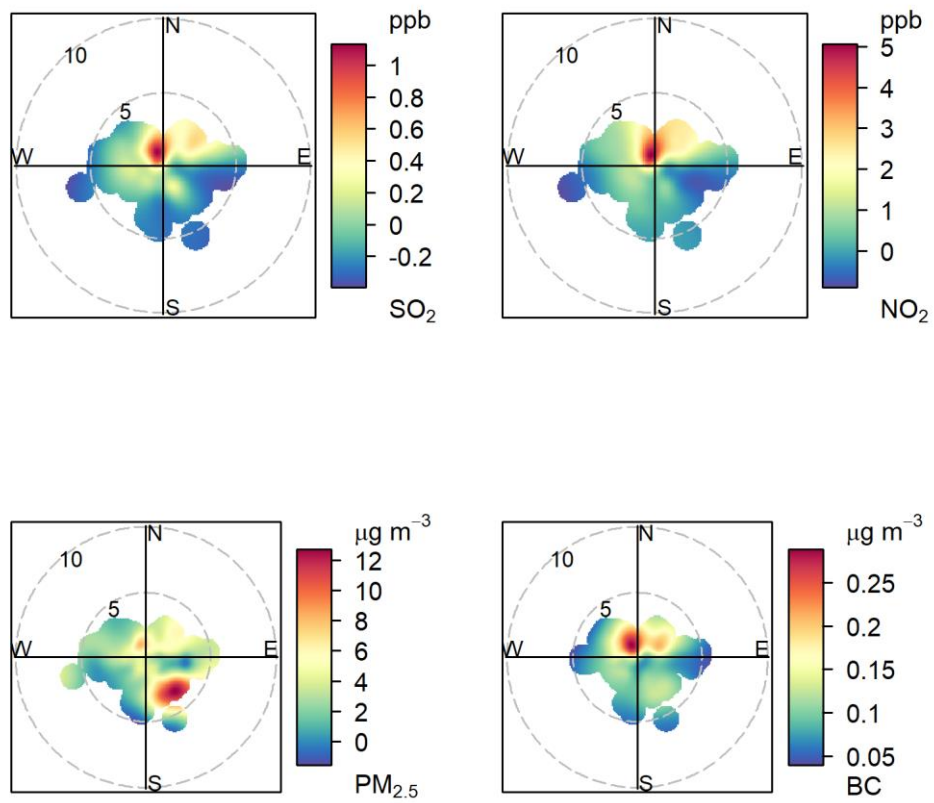
Figure S8: Pollution roses for SO2, NO2, PM2.5 and BC for the period of the campaign. Note how high SO2 and NO2 concentrations come from the north at low wind speeds, suggesting a non-continuous emitting local source in the direction of the main road.