



Supplement of

In situ formation and spatial variability of particle number concentration in a European megacity

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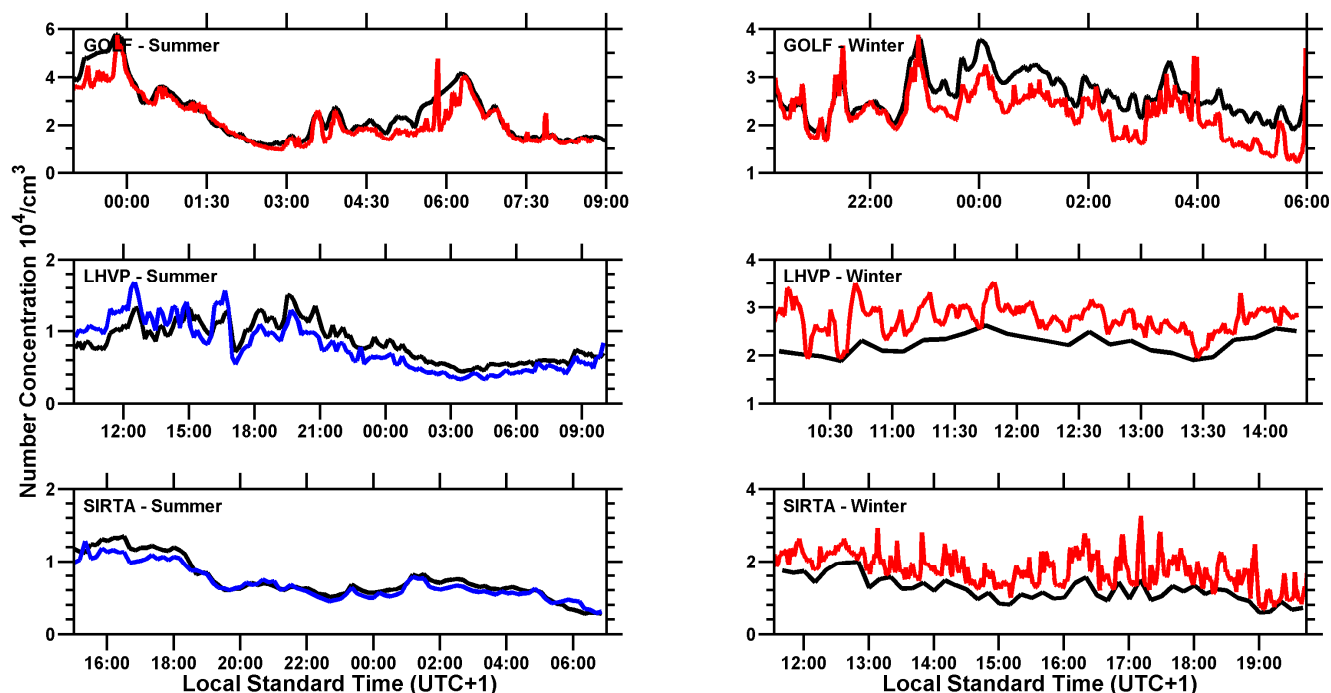
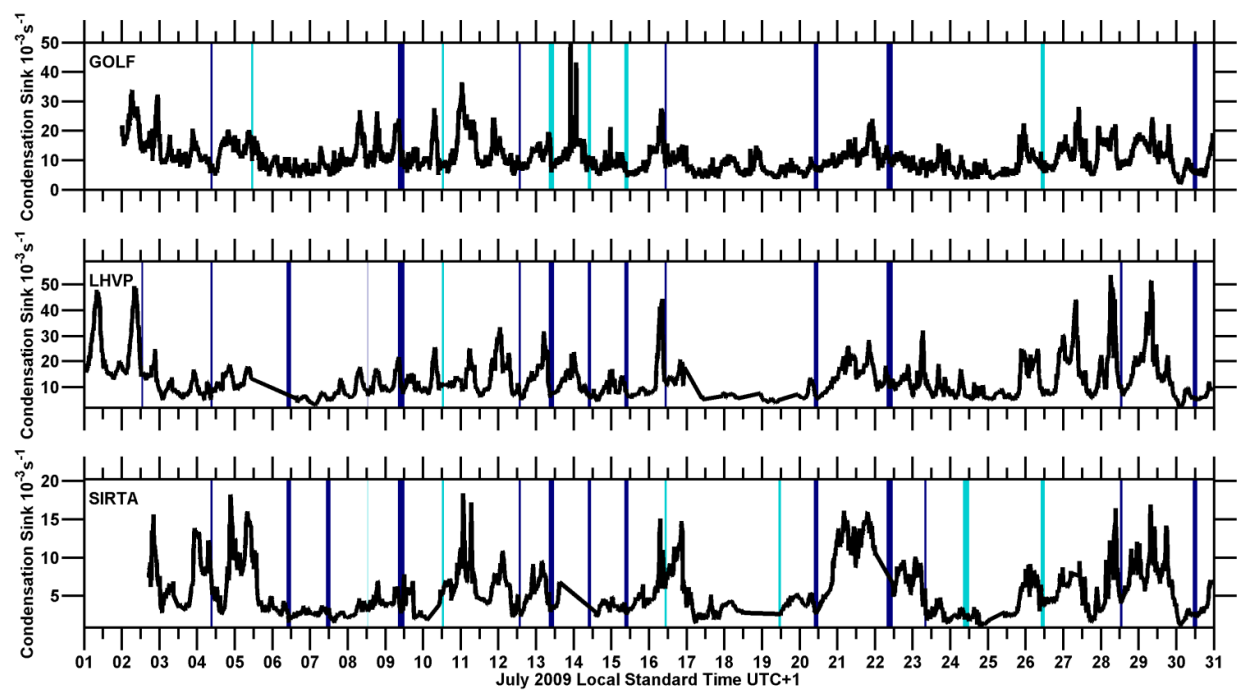


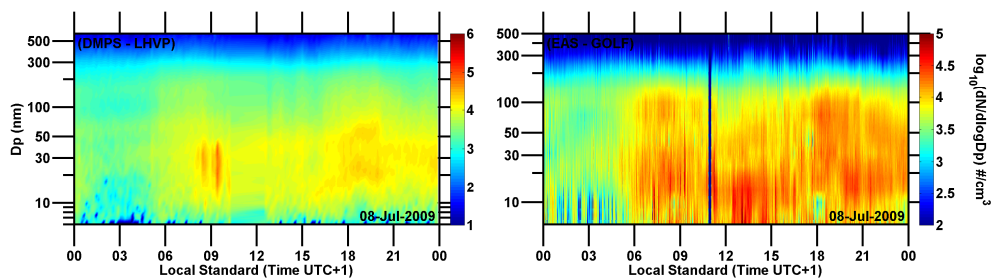
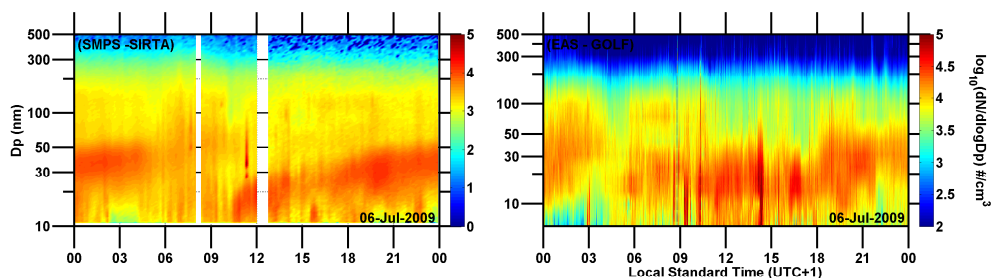
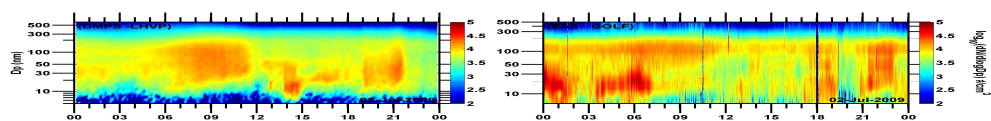
Figure S1. Time series of particle number concentration used for intercomparison between aerosol sizing instrumentation located at the stationary sites (black lines) and the mobile laboratory CPC (MoLa - red line; MOSQUITA - blue line). During summer the difference does not exceed 10% at all sites. The larger discrepancy at SIRTA during winter is attributed to the lower size detection limit of the CPC employed at MoLa (2.5 nm) compared to the 10 nm of the SMPS system at SIRTA.



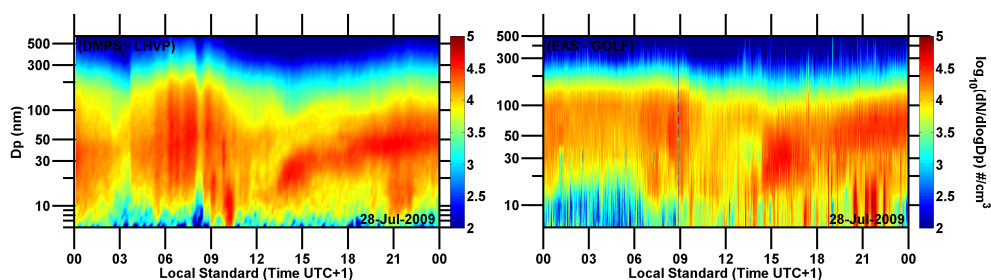
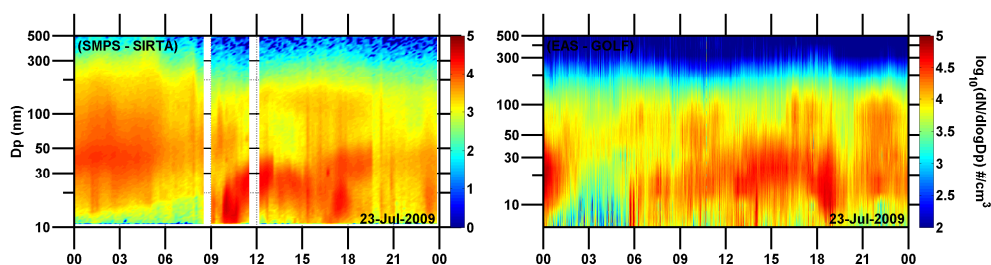
56 **Figure S2.** Condensation sink measured at the three ground sites during July 2009. Dark
 57 and light blue bars indicate the event and undefined periods, respectively.

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Figure S3. Number size distribution time series when a nucleation event was identified at SIRT and/or LHVP but not at GOLF. D_p is the particle diameter.

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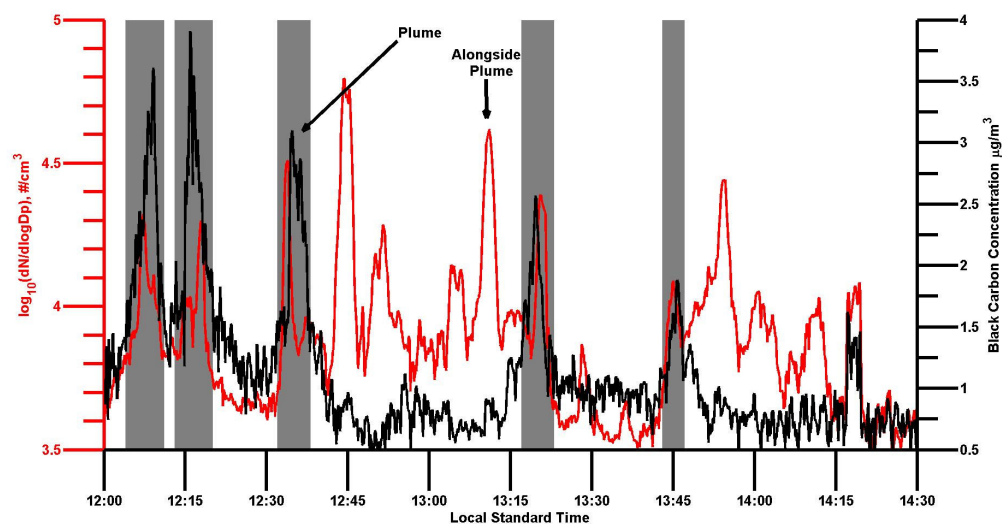
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98 **Figure S4.** Number (red line) and black carbon (black line) concentrations during
 99 airborne measurements on July 1st 2009. Number concentration increases observed
 100 simultaneously with increases in black carbon mass concentration (grey areas) were
 101 attributed to the Paris plume. Number concentration increases were also observed along
 102 the plume.

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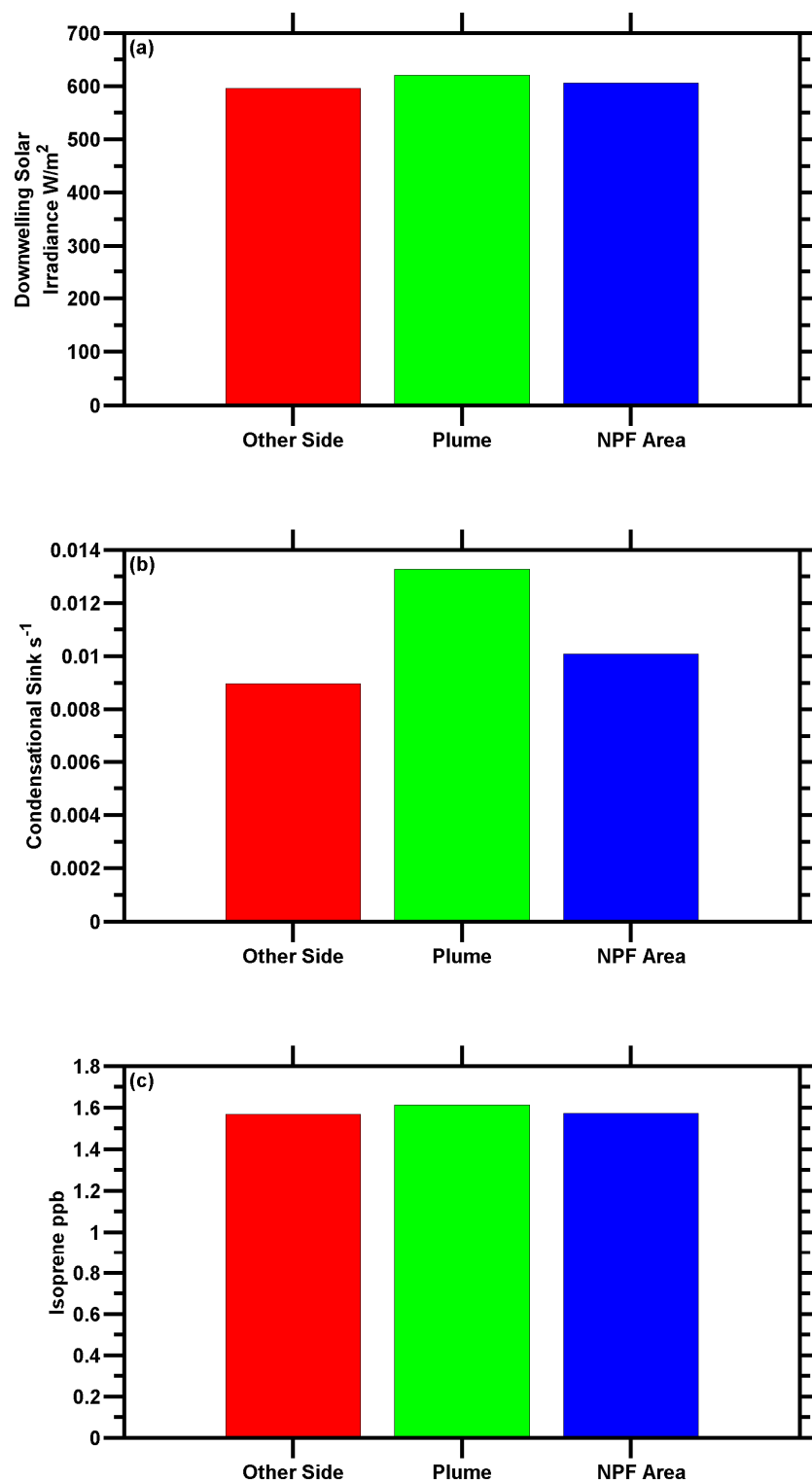


Figure S5. Downwelling solar irradiance (top), condensation sink (middle) and isoprene concentration (bottom) comparison of the Paris plume with areas on either side of the plume when high particle concentrations were observed at one side outside of the plume. Significant differences among these areas were not observed with respect to condensation sink, isoprene and solar irradiance.