

1 **SUPPORTING INFORMATION**

2 **On the Spatial Distribution and Evolution of Ultrafine Aerosols in Urban Air**

3
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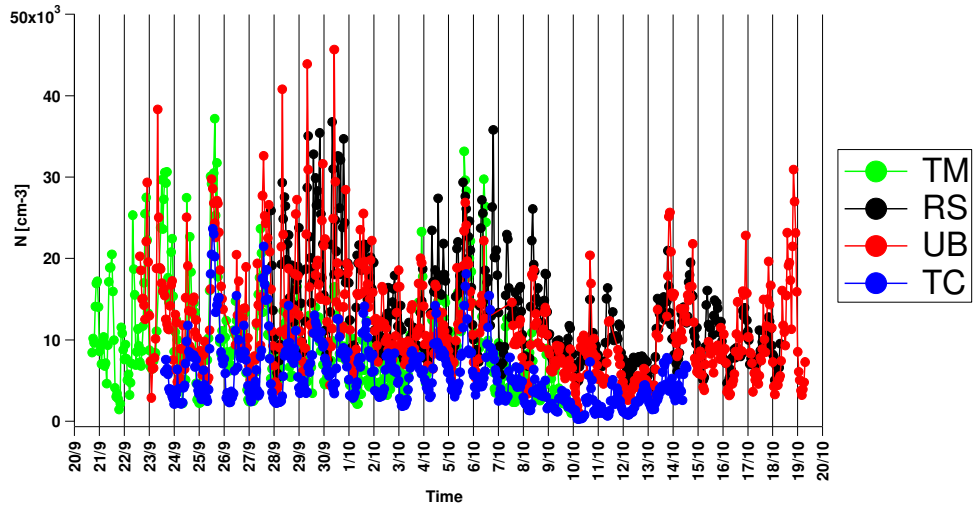
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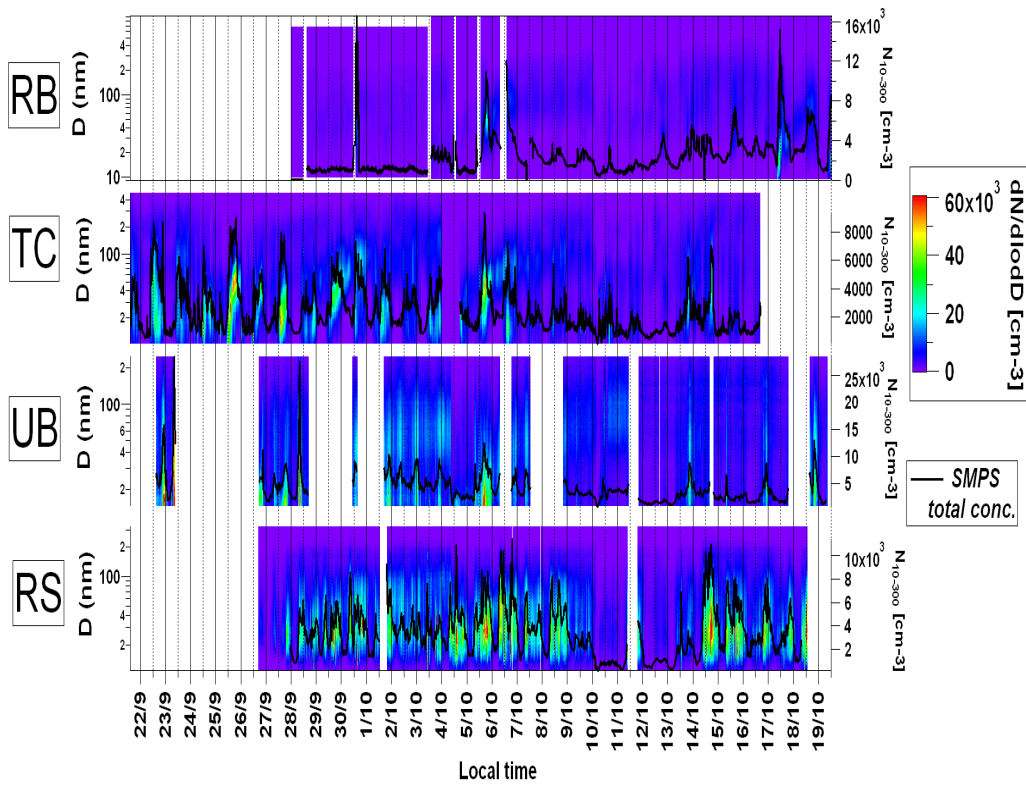
Fig. S1. Monitoring sites in Barcelona, Spain

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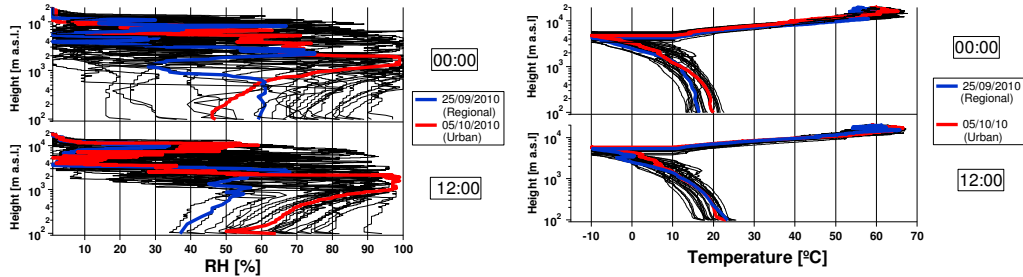
3 **Fig. S2.** Temporal trends of the particle number concentrations measured during the SAPUSS
4 project at four different monitoring sites.



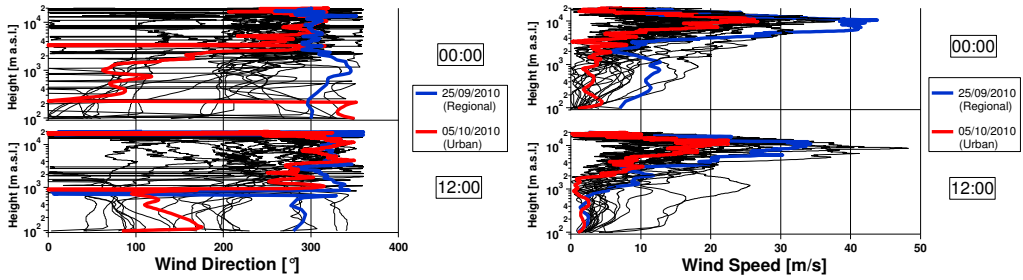
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6 **Fig. S3.** Temporal trends of the aerosol size distributions during the SAPUSS project at four
7 different monitoring sites.

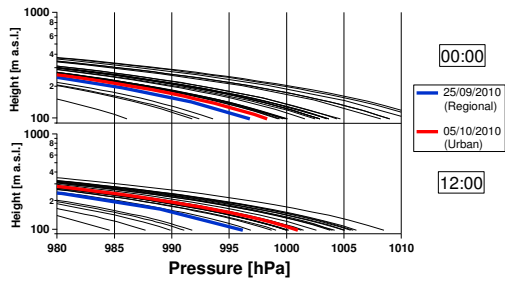
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7 **Fig. S4.** Vertical profiles of RH, temperature, wind direction, wind speed and air pressure
8 obtained with radio sounding balloons performed twice per day (at 12:00 UTC and 00:00
9 UTC) at the UB site throughout the SAPUSS campaign (64 balloons in total). Enhanced in
10 colour are the profiles obtained during the regional (blue) and urban (red) nucleation events.

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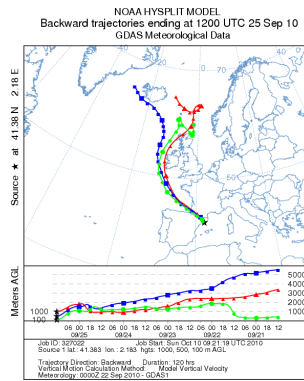
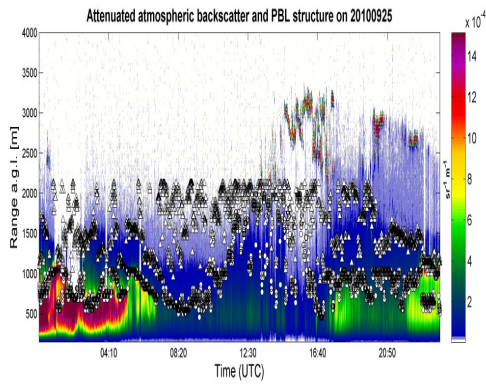
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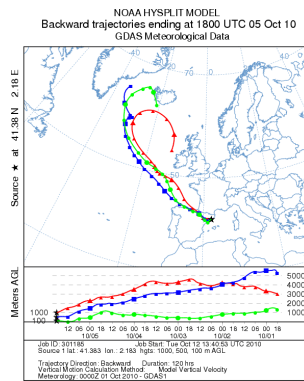
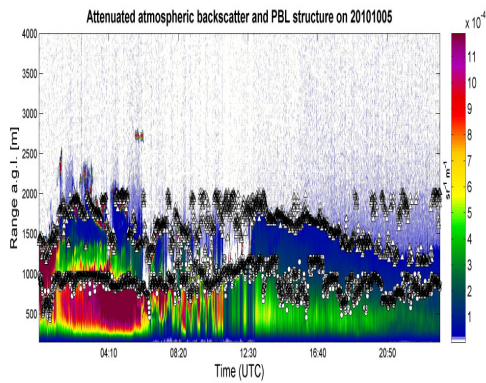


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(a)



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(b)

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10 **Fig. S5.** Diurnal profile of the boundary layer and air mass back trajectories during the (a)
 11 regional nucleation event on 25th September 2010 and (b) the urban nucleation event on 5th
 12 October 2010.

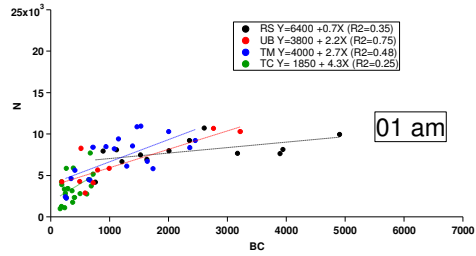
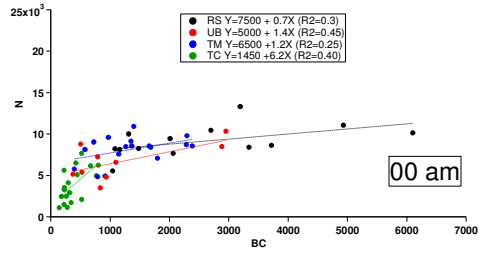
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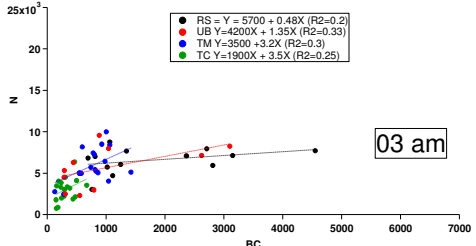
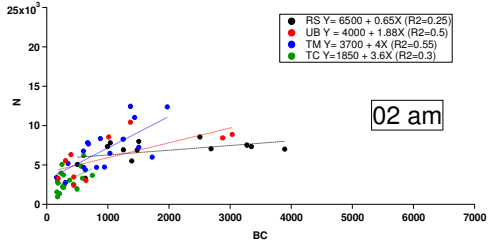
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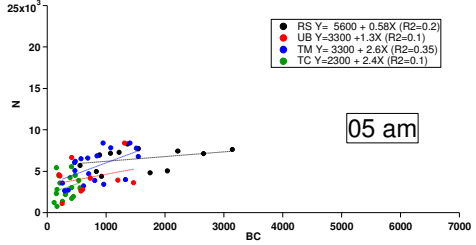
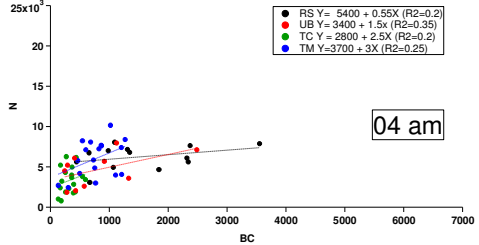
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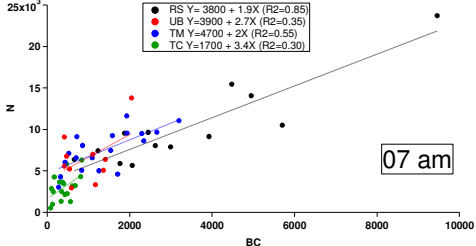
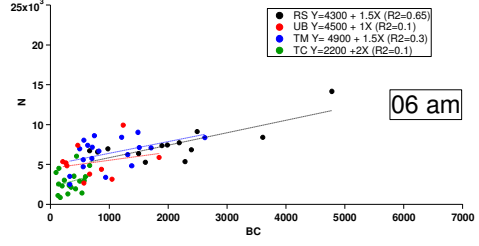
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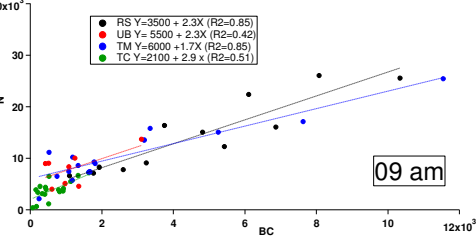
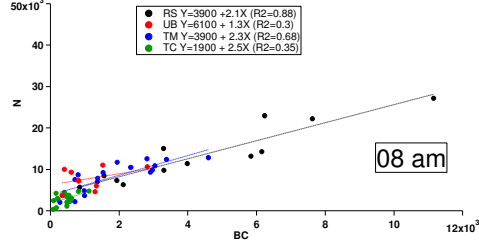
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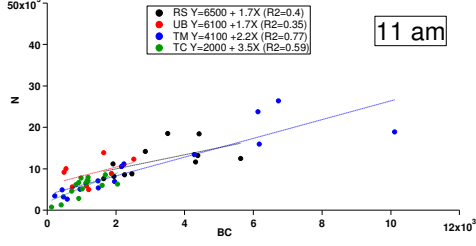
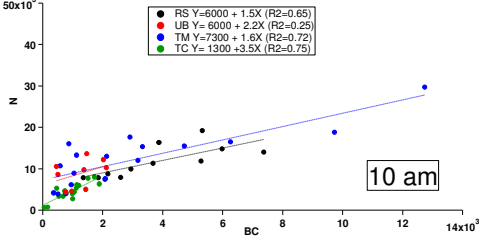
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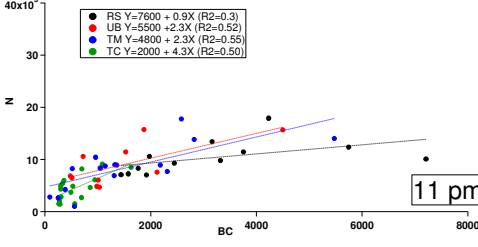
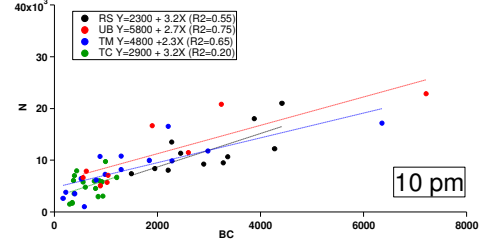
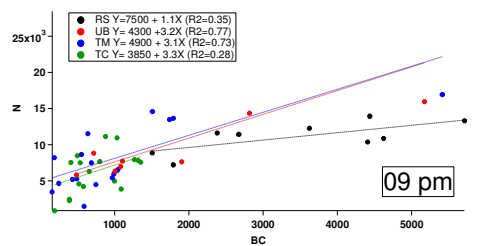
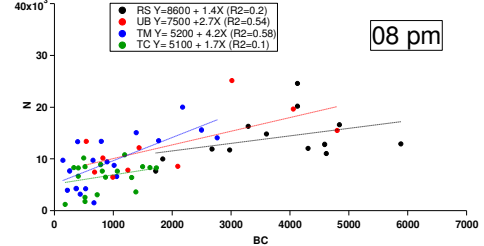
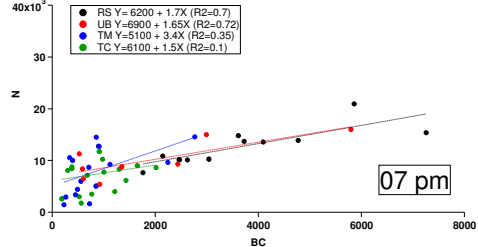
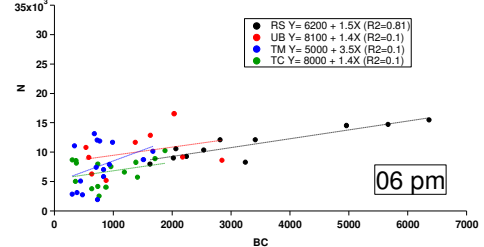
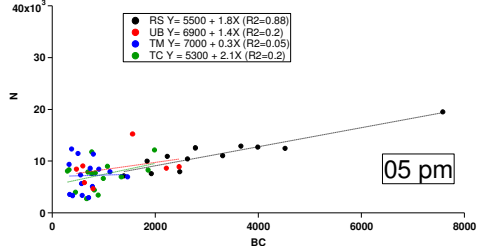
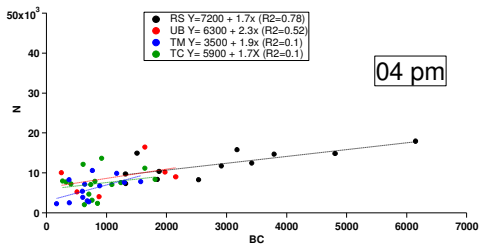
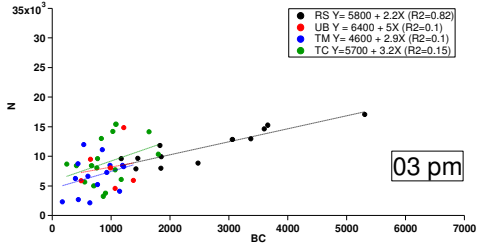
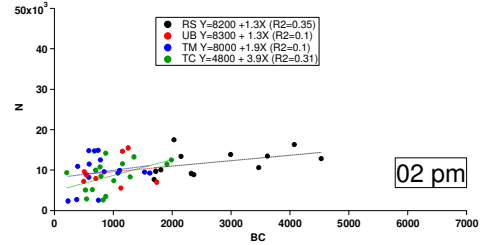
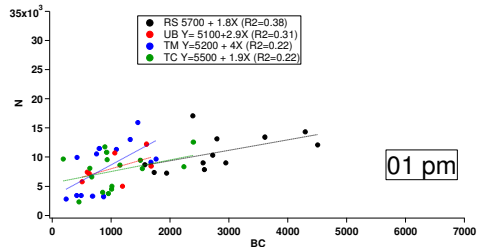
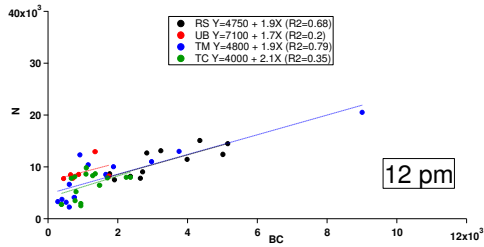
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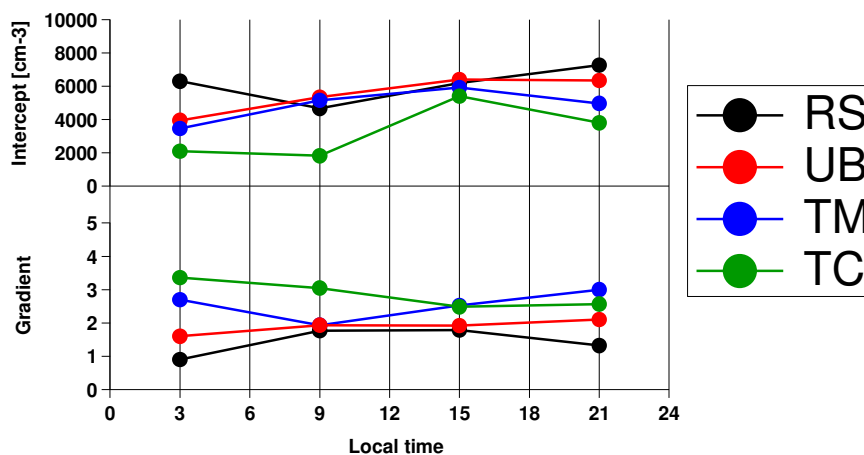
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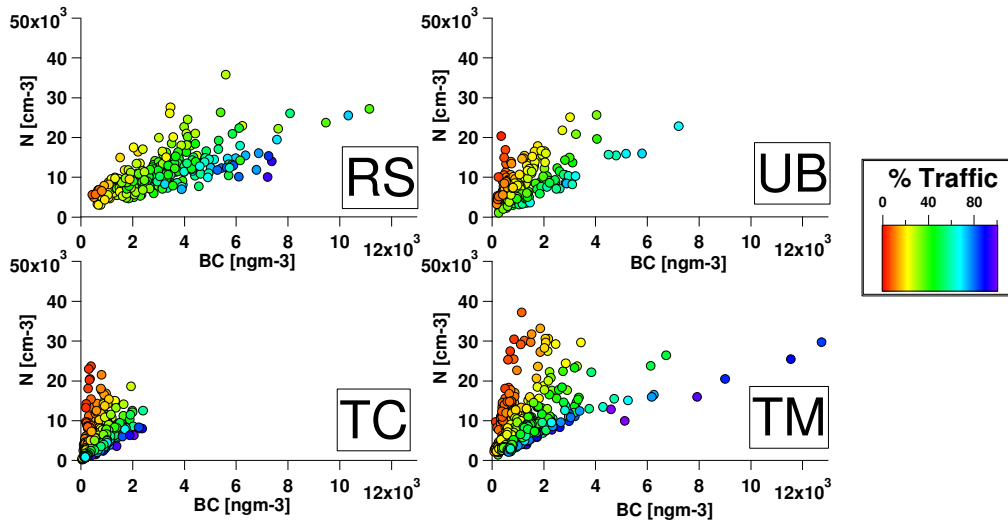
Fig. S6. Linear correlation between BC (ng m^{-3}) and N (cm^{-3}) at four different monitoring sites for each hour of the day.



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Fig. S7. Gradient and intercept binned at six hour intervals obtained from the linear correlations of Fig. S6.

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Fig S8. Percentage of primary non volatile traffic particles (% Traffic) at the four different monitoring sites.