



*Supplement of*

## **Transport of anthropogenic and biomass burning aerosols from Europe to the Arctic during spring 2008**

**L. Marelle et al.**

*Correspondence to:* L. Marelle ([louis.marelle@latmos.ipsl.fr](mailto:louis.marelle@latmos.ipsl.fr))

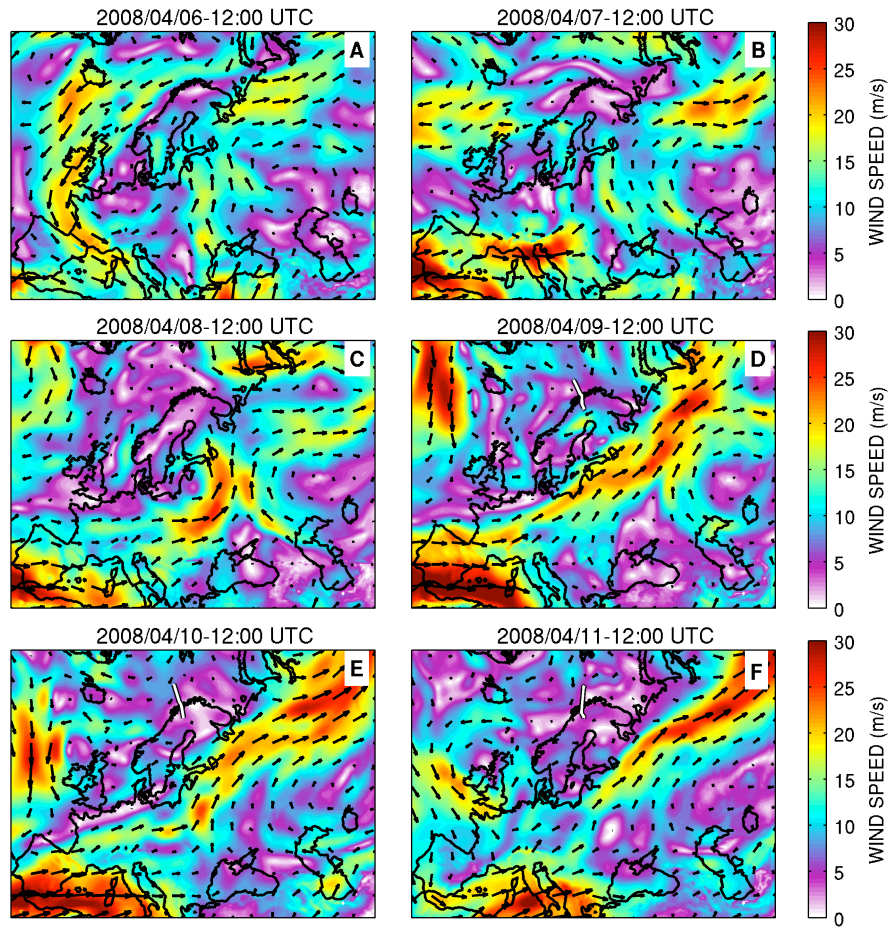


Figure S1. 700 hPa wind speed with arrows showing wind direction on 6, 7, 8, 9, 10 and 11 April at 12 UTC. POLARCAT-France flight tracks are shown for the 9, 10 and 11 April flights on panels D, E, F respectively (in white).

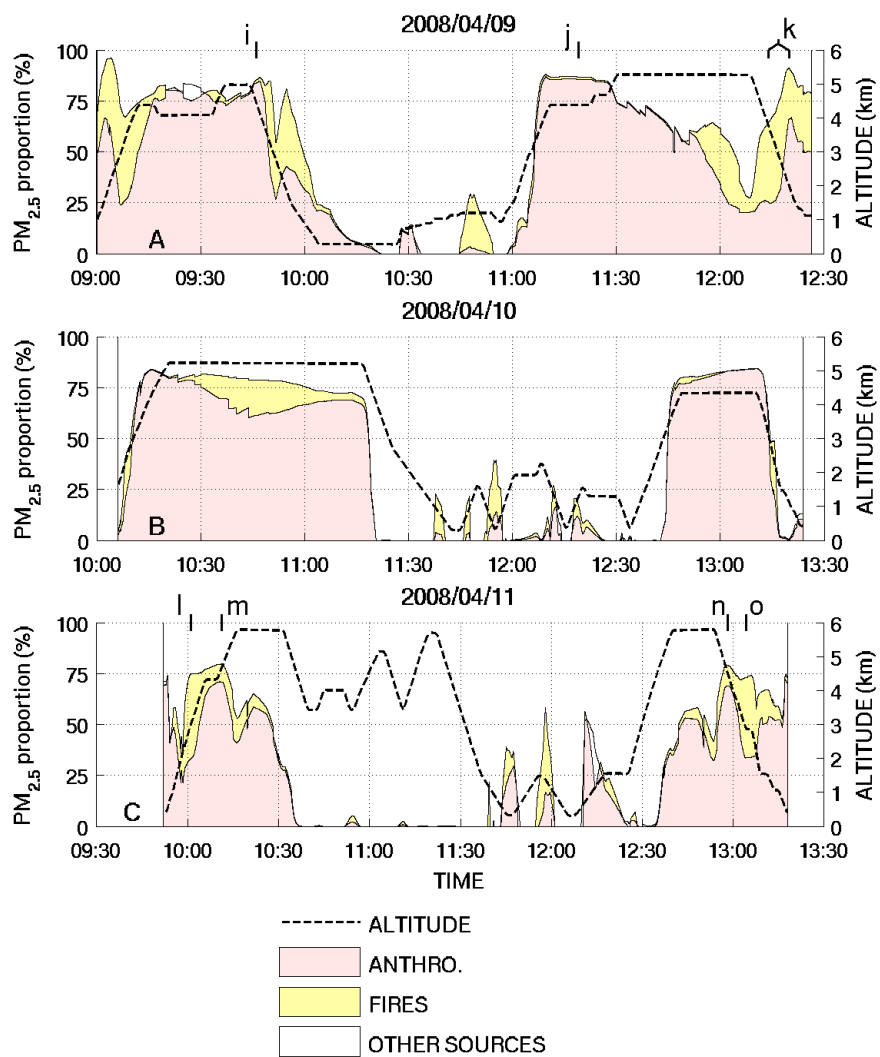


Figure S2. Stacked area plot representing the percentage of total  $PM_{2.5}$  attributed to anthropogenic (pink) and fire (yellow) emissions, along the POLARCAT-France spring flight tracks. Plane altitude is in black. (A) 2008/04/09 flight (B) 2008/04/10 flight (C) 2008/04/11 flight. Letter labels indicate anthropogenic (I, J, M, N) and mixed anthropogenic/fire (K, L, O) plumes investigated further.

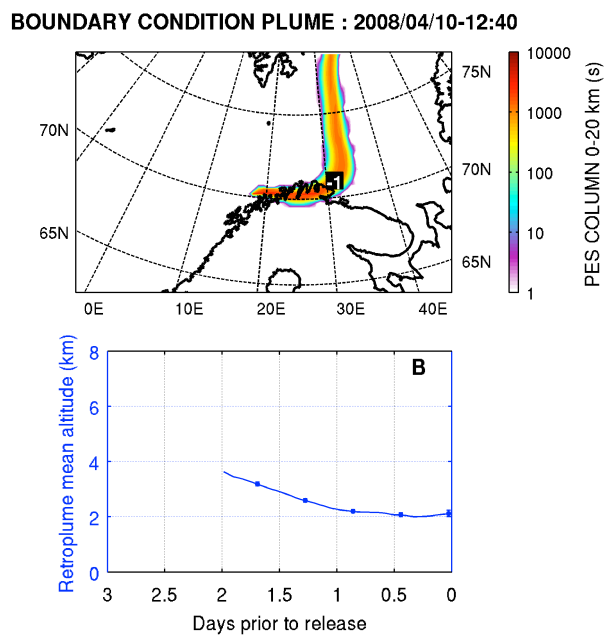


Figure S3. Backward mode FLEXPART-WRF simulation showing typical transport pathways for a boundary condition plume (originating on the 2008/04/10, at 12h40 UTC on the flight track). (A) Column integrated PES, (B) plume mean altitude with RMS error bars.

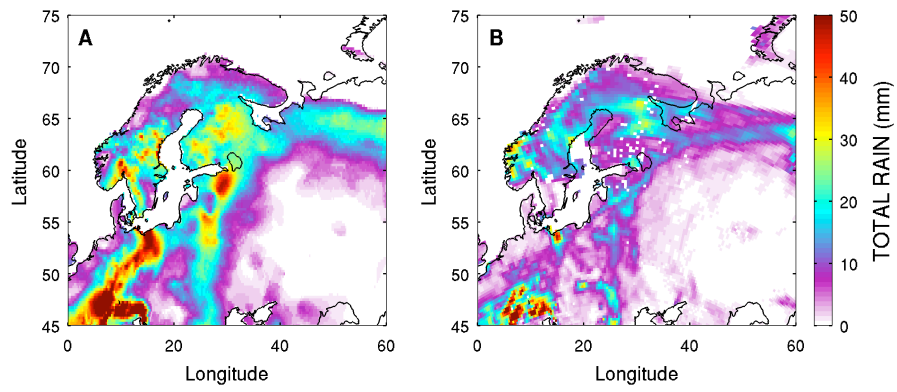


Figure S4. Total accumulated rain between 4 April 2008 0 UTC and 12 April 2008 0 UTC (A) in the ECA E-OBS 0.25° gridded dataset (B) in WRF-Chem (CTL). An ocean mask (also masking inland lakes) has been applied to the map in panel B.

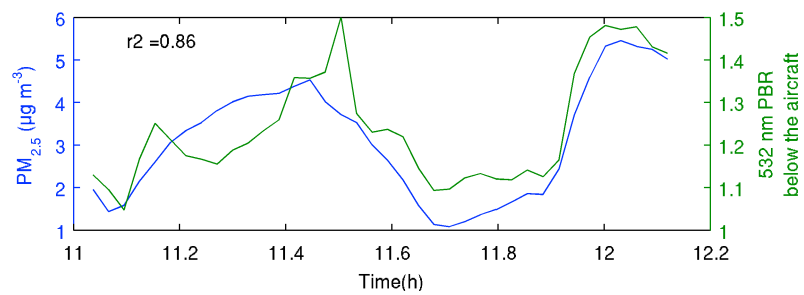


Figure S5. Measured PM<sub>2.5</sub> (blue) and LIDAR Pseudo Backscatter Ratio (PBR) at 532 nm close below the aircraft (green) between 11:00 UTC and 12:12 UTC during the 9 April 2008 flight.

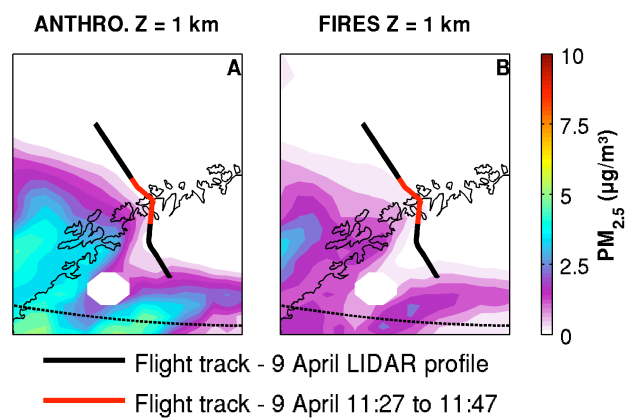


Figure S6. Map of anthropogenic (A) and fire (B) PM<sub>2.5</sub> sections at 1 km, on 9 April 2008 at 12 UTC. The flight track during the LIDAR profile shown in figure 10 is shown in black, and the part of the flight (from 11:27 to 11:47) when an aerosol plume was measured by LIDAR at 1 km is highlighted in red.