



## **Lagrangian analysis of forest fire aerosol emissions from North America to Western Mediterranean basin during the CHARMEX 2013 summer campaign**

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Several intense forest fires occurred in Canada and Alaska in the second half of June 2013, as identified from satellite observations. Main detected fire areas with large fire radiative power were identified close to the Hudson bay and in the Northwest Territories. Satellite observations show that a significant fraction of the aerosol produced by these fires was transported to western Europe when the CHARMEX-ADRIMED\* field campaign took place. Lidar observations from space, aircraft and ground confirmed that the western Mediterranean area has been indeed impacted by these fires at various altitudes. A forward simulation of the Lagrangian plume dispersion model FLEXPART was conducted to quantify the spatial extent of the fire plume transport for 11 days. The FLEXPART model was initialized with aerosol mass corresponding to the main fire locations identified by MODIS. A main altitude of injection of 3 km as identified from the CALIPSO lidar observations over Canada close to the forest fires areas. Mapping the column integrated aerosol concentrations show that values exceeding  $10 \mu\text{g}/\text{m}^3$  could be observed at almost all latitudes north of  $55^\circ\text{N}$ , reaching much lower latitudes over Europe, down to the Western Mediterranean area 4-10 days after the emission from Canada. In the ADRIMED domain the plume was observed in a large altitude range (2.5 - 7.5 km) and indeed elevated aerosol load have been sensed by satellites as well as airborne and ground-based remote sensing instruments deployed during CHARMEX- ADRIMED on June 27th and 28th in Menorca, Cagliari and Lampedusa. As part of it Falcon 20 and ATR 42 observations allowed a detailed analysis of the biomass burning aerosol contribution superimposed on the aerosol background from Saharan dust emission. Results are presented and discussed.

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