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## Boreal forest fires in 1997 and 1998: a seasonal comparison using transport model simulations and measurement data

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**Abstract.** Forest fire emissions have a strong impact on the concentrations of trace gases and aerosols in the atmosphere. In order to quantify the influence of boreal forest fire emissions on the atmospheric composition, the fire seasons of 1997 and 1998 are compared in this paper. Fire activity in 1998 was very strong, especially over Canada and Eastern Siberia, whereas it was much weaker in 1997. According to burned area estimates the burning in 1998 was more than six times as intense as in 1997. Based on hot spot locations derived from ATSR (Along Track Scanning Radiometer) data and official burned area data, fire emissions were estimated and their transport was simulated with a Lagrangian tracer transport model. Siberian and Canadian forest fire tracers were distinguished to investigate the transport of both separately. The fire emissions were transported even over intercontinental distances. Due to the El Niño induced meteorological situation, transport from Siberia to Canada was enhanced in 1998. Siberian fire emissions were transported towards Canada and contributed concentrations more than twice as high as those due to Canada's own CO emissions by fires. In 1998 both tracers arrive at higher latitudes over Europe, which is due to a higher North Atlantic Oscillation (NAO) index in 1998. The simulated emission plumes are compared to CMDL (Climate Monitoring and Diagnostics Laboratory) CO<sub>2</sub> and CO data, Total Ozone Mapping Spectrometer (TOMS) aerosol index (AI) data and Global Ozone Monitoring Experiment (GOME) tropospheric NO<sub>2</sub> and HCHO columns. All the data show clearly enhanced signals during the burning season of 1998 compared to 1997. The results of the model simulation are in good agreement with ground-based as well as satellite-based measurements.

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