



The rapid rise of the Australian Black Saturday plume

Jos de Laat, Deborah Zweers-Stein, Reinout Boers, and Ruud Dirksen
KNMI, KS/AK, De Bilt, Netherlands (laatdej@knmi.nl, 0031 030221040)

We present an analysis of the transport of smoke and aerosols from the 7 February 2009 Australian fires – aka Black Saturday – during the first days after the event.

Satellite observations of aerosols (OMI, GOME2, CALIPSO) and carbon monoxide (AIRS) indicate rapid eastward transport away from Australia towards the subtropical Pacific northeast of New Zealand – which is in good agreement with forward trajectory calculations. Furthermore, the observations also suggest that relatively fast vertical transport must have occurred, as within a few days after the event the smoke plume can be identified in CALIPSO observations at altitudes close to 20 km.

No dynamical processes could be identified that might have caused this rapid vertical transport (convection, frontal lifting; radiosonde measurements, AIRS temperature profile measurements), hence we hypothesize that this transport could be caused by both shortwave and longwave radiative effects of the smoke and aerosols, which as a net effect cause warming of the plume that enhances vertical movement. We present radiative transfer calculations in support of this hypothesis.