Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11094, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11094
EGU General Assembly 2008

The Fire Mediterranean Experiment (FIREMEX) initiative

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The FIREMEX initiative aims at improving our understanding of (i) the propagation dynamics of fires in the Mediterranean region, as well as (ii) the impact of such fires on the radiative budget in the Mediterranean basin and on the air quality of costal megacities.

To date, little is known on the respective roles of meteorological conditions (winds, moisture, atmospheric stability, rain in the previous days, ..), surface characteristics (land use, type of vegetation, soil moisture, ..) and topography and their interactions at the meso-scale. These interactions control the propagation of fires (direction and speed of the front), their intensity (injection height, heat budget, ..) and their type (open, etc..). Furthermore, fires are significant emission sources of gases (including greenhouse gases such as water vapor and carbon dioxide) as well as aerosols. At the local scale, combustion products may in turn modify the propagation dynamics of fires through direct radiative effects and/or cloud formation. At the larger scale, these gases and aerosols injected to high altitudes by pyro-convection are available for long-range transport and impact the radiative budget.

FIREMEX was initiated by several leaders in academic research aiming at bringing together state-of-the-art instrumentation and numerical models to make decisive progress concerning the meso-scale processes relevant to Mediterranean fires dynamics and their impact on the regional radiative budget. A key element of this initiative

is the organization of an international field campaign to be held in 2010-2011. The experimental strategy calls for a complementary ground-based/airborne observational approach to be coordinated with short-range forecast of fire propagation and near-real space-borne detection of associated smoke plumes, in order to address all relevant issues. FIREMEX will take advantage of the latest development in remote sensing instrumentation for ground-based and airborne platforms, recent advances in fire plumes detection from space, as well as the novel airborne platforms such as equipped ultralights and civil security aircraft.