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## Ground-based PTR-MS measurements of reactive organic compounds during the MINOS campaign in Crete, July–August 2001

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**Abstract.** This study presents measurements of acetonitrile, benzene, toluene, methanol and acetone made using the proton-transfer-reaction mass spectrometry (PTR-MS) technique at the Finokalia ground station in Crete during the Mediterranean Intensive Oxidant Study (MINOS) in July–August 2001. Three periods during the campaign with broadly consistent back trajectories are examined in detail. In the first, air was advected from Eastern Europe without significant biomass burning influence (mean acetonitrile mixing ratio 154 pmol/mol). In the second period, the sampled air masses originated in Western Europe, and were advected approximately east-south-east, before turning south-west over the Black Sea and north-western Turkey. The third well-defined period included air masses advected from Eastern Europe passing east and south of/over the Sea of Azov, and showed significant influence by biomass burning (mean acetonitrile mixing ratio 436 pmol/mol), confirmed by satellite pictures. The mean toluene:benzene ratios observed in the three campaign periods described were 0.35, 0.37 and 0.22, respectively; the use of this quantity to determine air mass age is discussed. Methanol and acetone were generally well-correlated both with each other and with carbon monoxide throughout the campaign. Comparison of the acetone and methanol measurements with the MATCH-MPIC model showed that the model underestimated both species by a factor of 4, on average. The correlations between acetone, methanol and CO implied that the relatively high levels of methanol observed during MINOS were largely due to direct biogenic emissions, and also that biogenic sources of acetone were highly significant during MINOS (~35%). This in turn suggests that the model deficit in both species may be due, at least in part, to missing biogenic emissions.

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