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## Cloud condensation nuclei measurements in the marine boundary layer of the Eastern Mediterranean: CCN closure and droplet growth kinetics

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**Abstract.** Measurements of cloud condensation nuclei (CCN) concentrations ( $\text{cm}^{-3}$ ) between 0.2 and 1.0% supersaturation, aerosol size distribution and chemical composition were performed at a remote marine site in the eastern Mediterranean, from September to October 2007 during the FAME07 campaign. Most of the particles activate at  $\sim 0.6\%$  supersaturation, characteristic of the aged nature of the aerosol sampled. Application of Köhler theory, using measurements of bulk composition, size distribution, and assuming that organics are insoluble resulted in agreement between predicted and measured CCN concentrations within  $7 \pm 11\%$  for all supersaturations, with a tendency for CCN underprediction ( $16 \pm 6\%$ ;  $r^2 = 0.88$ ) at the lowest supersaturations (0.21%). Including the effects of the water-soluble organic fraction (which represent around 70% of the total organic content) reduces the average underprediction bias at the low supersaturations, resulting in a total closure error of  $0.6 \pm 6\%$ . Using threshold droplet growth analysis, the growth kinetics of ambient CCN is consistent with NaCl calibration experiments; hence the presence of aged organics does not suppress the rate of water uptake in this environment. The knowledge of the soluble salt fraction is sufficient for the description of the CCN activity in this area.

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