VARIATIONS OF CN NUMBER CONCENTRATIONS WITH RESPECT TO METEOROLOGICAL CONDITIONS AT MACE HEAD, IRELAND

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During the Atmosphere/Ocean Experiment (AEROCE) measurements of condensation nuclei (CN) concentrations and meteorological parameters were conducted at the Mace Head field station (53° 19' N, 9° 54' W), located at the west coast of Ireland. The CN concentrations were measured with a TSI Model 3760 particle counter. The resulting time series cover the period from July 1991 to September 1994. All data were recorded at one minute intervals.

In this contribution the dynamics of the measured CN concentrations are investigated in relation to the meteorological conditions. Emphasis is laid on variations in relative humidity favouring changes in CN numbers. Presented are cases of diurnal variations of relative humidity defining the course of CN concentrations. An increase of relative humidity under dry weather conditions can cause both an increase as well as a decrease of CN concentrations. Statistical analyses reveal a striking good correlation between the parameters in both cases, resulting in correlation coefficients $r^2 > 0.60$ which are significant at the 95% confidence level. The correlation could be observed both under background conditions and in anthropogenic influenced air masses. A discussion of the CN dynamics includes the investigation of CN bursts in clean air masses described in a companion paper by Geever et al. 3 dimensional backward air mass trajectories and AVHRR satellite images of cloudiness are considered for further interpretations.