

Sea salt production and its role in warm clouds formation

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The Mediterranean Region is characterized by a mixture of aerosols of various origins and sources. Sea salt and desert dust comprise of the most important natural sources, while anthropogenic activities and biomass burning have also contribution. The composition of this mixture highly affects the nucleation processes as well as cloud formation and evolution.

The main objective of this work is to better understand the nucleation processes and the role of sea salt and other aerosols on the marine boundary layer characteristics and orographic cloud formation. Sea salt particles, regardless their small quantities compared with dust amounts during episodes, constitute a very efficient CCN, playing a key role in cloud formation, especially during the initial stage.

The study focuses on the eastern part of the Mediterranean Sea and particularly in Crete and East Mediterranean Coast. The fully-coupled modeling system RAMS/ICLAMS is used to perform this study. Cloud characteristics retrieved from satellite data and in situ data from the remote location station of Finokalia are used for comparison with the model simulations and a more comprehensive analysis.

Among the results, there is the obvious important role of the Aegean islands along with the steep orography of Crete in the warm cloud formation. The atmospheric aerosol characteristics and the cloud formation mechanism affect the droplet size distribution and the cloud droplet concentration in various ways which are further analyzed.