

**MESOSPHERIC AEROSOL PARTICLES STUDIED WITH IN SITU TECHNIQUES:
AN OVERVIEW OF RESULTS FROM THE ECOMA-PROJECT
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A total of six sounding rockets were launched during three field campaigns in the years 2006, 2007, and 2008 from the North-Norwegian Andøya Rocket Range to study the Existence and Charge state Of Meteoric smoke in the middle Atmosphere (ECOMA) and its relation to mesospheric ice particles. A new particle detector was successfully developed which combines the conventional technique of a Faraday-Cup with the active photo ionization of particles and subsequent detection of corresponding photo electrons. In this paper we will give an overview of results from these rocket campaigns. Some noteworthy findings are the experimental verification of meteor smoke existence throughout the entire mesosphere, the first direct in situ measurement of mesospheric ice volume, and new insights into the charging properties of meteoric smoke under the conditions of polar summer. Finally we will also present implications of our results for the understanding of the seasonal variation of meteoric smoke, and we close with a discussion of the significance of our findings for the issue of ice particle nucleation in the polar summer mesopause region.

Mesosphere, Meteor Smoke, Mesospheric Ice Clouds

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