



Evidence of Meteor Smoke Particles as precursors for formation of mesospheric clouds on Mars

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Mesospheric clouds have been systematically observed in the Martian mesosphere for about a decade. Not all of the observations allow for the cloud composition to be defined. However, several observations have revealed clouds formed of CO₂ ice crystals, although in some cases a water ice composition has been detected as well. The condensation of the main component of the atmosphere is a fairly unique phenomenon. Although the lower atmosphere of Mars is very dusty and rich in ice nuclei, the mesosphere should be fairly devoid of dust lifted from lower layers (due to weak probability of lifting to high altitudes and low atmospheric densities favouring sedimentation). A very interesting candidate as a source of ice nuclei in the mesosphere comes from a terrestrial analogue. Meteor Smoke Particles have been shown to play a role in the formation of the mesospheric clouds on the Earth, and in a recent modelling study we have been able to show that an exogenous source of ice nuclei is required in the Martian mesosphere to be able to model clouds with observed properties. We will present a short review of observations and a summary of the cloud properties, and then discuss the model results pointing towards Meteor Smoke Particles as a necessary ingredient for the formation of mesospheric clouds on Mars.