UP 11: Atmosphäre

Time: Thursday 17:00–17:30 Location: G/gHS

Invited Talk UP 11.1 Thu 17:00 G/gHS

Radar meteor echoes and their relation to atmospheric and plasma physics — •Jorge L. Chau[1], Gunter Stober[1], Carsten Schult[1], Irina Strelnikova[1], and Meers M. Oppenheim[2] — [1]1.*Leibniz Institute of Atmospheric Physics at Rostock University, Germany — [2]2.*Center for Space Physics at Boston University, USA

For over 60 years radars have detected echoes coming from meteors. These echoes have been classified in three types: (a) head echoes coming from plasma as it forms in front of the meteoroid, (b) specular trail echoes that are due to Fresnel scattering, and (c) nonspecular trail echoes also known as range-spread echoes. These three classes of echoes occur at a rate of a few meteors per second to a few meteors per minute, depending on the location, size of the radar, pointing direction, etc. Radar meteor echoes have been used and studied in a variety of fields, like, Astronomy, Telecommunications, Aeronomy, Plasma Physics, etc. In this work, we present an overview of how these echoes are currently being exploited to diagnose the upper atmosphere. For example obtaining: (1) neutral winds, temperatures, and neutral densities from specular echoes, (2) neutral winds from non-specular echoes, and (3) meteor mass deposited in the atmosphere from meteor-head echoes. A special focus is devoted to the non-specular echoes, from both an observational as well as theoretical point of view. Our observations include those echoes associated to field-aligned irregularities and those that cannot come from field-aligned irregularities. Finally, we present preliminary results from a novel approach to get horizontally resolved wind fields from specular meteor echoes.