

## **Recognition of Meteor Showers from the Heights of Ionization Trails**

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Meteoroids constantly enter the Earth's atmosphere, collide with atmospheric molecules, and heat and ablate in the sufficiently dense atmospheric layers at heights between 70 and 110 km. It is still a problem to recognize properties of the meteor streams among the sporadic background. The meteor radar observations at Sodankylä Geophysical Observatory (67°22'N, 26°38'E, Finland) during 2008–2017 show that meteoroids of some showers produce ionization trails at altitudes noticeably exceeding those of sporadic meteors. Using the median height of meteor trails and corresponding upper and lower quartiles as a metric, we unambiguously distinguish all northern hemisphere meteor showers with a zenithal hourly rate larger than 12, namely, the Quadrantids, Lyrids, Eta Aquariids, Arietids (or/and Daytime Zeta Perseids), Perseids, Orionids, Leonids, and Geminids. Additionally, signatures of a possible meteor stream during 26–30 January were detected, although identification of this stream is still under question. This new analysis indicates that the origin of the shower meteor trails at higher altitudes is likely due to higher speed and probably lighter or less dense meteoroids belonging to the showers.