

## **RADAR STUDIES OF THE METEOROID INFLUX TO THE EARTH ATMOSPHERE**

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Meteoroids roam through the solar system with orbits of all inclinations. The ones which cannot be associated to meteor showers are termed sporadic meteoroids. Relative to the direction of the Earth orbital motion, sporadic meteors appear to come from distinct source regions in the sky. The visibility of these sources from a given local horizon and thus the input of meteoric material into the Earth atmosphere varies with latitude and time of day due to the tilt of the Earth axis. We have studied meteor head echoes using the EISCAT UHF radar system and trail echoes using a SKiYMet meteor radar, both located close to the Arctic Circle in northern Scandinavia. Head echoes are radio wave reflections from the plasma generated by the interaction of meteoroids with the atmosphere. The received power is confined in range, as from a point source, and moves with the line-of-sight velocity of the meteoroid. This and the large distance between the three EISCAT UHF receivers enable calculation of meteoroid orbits. At the Arctic Circle, the North Ecliptic Pole (NEP) is in zenith once every day all year round. At this particular and season dependent local time the ecliptic plane coincides with the local horizon. This means that the meteor sources are situated at comparable elevation angles once every day. Therefore, the meteoroid influx from the north ecliptic hemisphere can be compared throughout the year. Only considering the daily one hour when NEP is closest to zenith, the EISCAT UHF head echo rate is about a factor of three higher at summer solstice than during the other seasons. This is consistent with the meteor radar measurements, according to which the north toroidal source is the most prominent source during the first half of the year and the north apex one during the second half. We are currently extending these studies to a larger data set of meteor head echoes using the interferometric Shigaraki MU radar in Japan.

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