

## Meteor head echo observation with a high power large aperture (HPLA) radar and an open database of precise meteor orbit

NAKAMURA, Takuji<sup>1\*</sup> ; KERO, Johan<sup>2</sup>

<sup>1</sup>National Institute of Polar Research, <sup>2</sup>Swedish Institute of Space Physics (IRF)

Mass influx from the space into the terrestrial atmosphere is mainly caused by meteors. Meteors delivers various elements into the atmosphere, but the meteoric dust particles are also of great importance in the terrestrial atmosphere, as they act as nucleus for condensation and clouds and affect the various atmospheric phenomena both in physical and chemical aspects. Thus, to investigate the meteor flux, orbits and their interactions in the upper atmosphere is very important but at the same time the method of investigation is limited, especially for the precise measurements.

A high power large aperture (HPLA) radar technique is one of the recent technique to provide useful information on meteor influx and orbital information, as well as interactions with atmosphere. The recent development of the technique carried out using the middle and upper atmosphere radar (MU radar) of Kyoto University at Shigaraki (34.9N, 136.1S), which is a large atmospheric VHF radar with 46.5 MHz frequency, 1 MW output transmission power and 8330 m<sup>2</sup> aperture array antenna, has established very precise orbit observations with meteor head echoes. Since 2009, orbital data of about 120,000 meteors have been collected. A database is now being created as an open database for research and education. In this

study, we present the physical quantities and precisions obtained by our radar meteor head echo observations and the detail of the database.

Keywords: meteor, upper atmosphere, high power large aperture radar