

# Novel techniques of radar meteor observation

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Meteor radar observation has been carried out since the middle of last century. Meteor wind observations using Doppler shift of radar signals have been widely utilized for middle atmosphere studies in 1970s and 80s. In 1990s, new generation meteor radars with a solid-state transmitter, digitalized receivers, and highly reliable PC control, have become available commercially, which can execute high accuracy continuous observation of meteor winds.

On the other hand, the MU (middle and upper atmosphere) radar has contributed as a radar of developing new observation techniques such as atmospheric temperature measurement, radio-optical meteor observations, meteor head observation for precise determination of meteor orbits, as well as forward scatter observations.

HRO (Ham Radio Observation), forward-scatter radar observations using ham radio waves, has been developed by since 1996 and has prevailed over Japan during the active Leonid periods between 1998 and 2001. Inexpensive instruments have been used for radio meteor observations widely at various observatories. Although HRO technique itself was simple, recent development of new generation HRO system being established by multi-disciplinary researchers is of great interest as a development of inexpensive high-quality forward-scatter radar system. Expected contribution of the development of new multistatic forward-scatter meteor radar systems will be discussed in the paper.