BRAMS: the Belgian RAdio Meteor Stations
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Abstract

BRAMS (Belgian RAdio Meteor Stations) is a new facility currently developed in Belgium to detect and study meteors with radio forward scattering techniques. The transmitter is a dedicated beacon and 25 receiving stations (including one interferometer) are spread all over Belgium. The characteristics of BRAMS and the scientific goals of the project will be discussed. Preliminary results for the automatic detection and counting of meteor echoes will be presented as well as initial results obtained with the interferometer. The methods planned to calculate meteoroid flux densities and trajectories of individual meteoroids will be discussed.

1 Short description of BRAMS

The Belgian Institute for Space Aeronomy (BISA) is currently developing a new observing facility to detect and study meteors with radio forward scattering techniques. The project is called BRAMS for Belgian RAdio Meteor Stations. The transmitter is a beacon located in Dourbes (South of Belgium) emitting a circularly polarized pure sine wave at 49.97 MHz and with a constant power of 150 watts. Around 25 receiving stations are spread all over Belgium and form a relatively dense network which increases the number of meteor detections. One station located in Humain (at ~ 50 km from Dourbes) is an interferometer which can retrieve the direction of arrival of the meteor echo with an accuracy of the order of 1°.

2 Scientific goals and challenges

The main scientific goals of BRAMS are the computation of meteoroid flux densities and the retrieval of individual meteoroid trajectories from multiple stations detections. The methods used to reach these objectives will be presented. Since each station will generate approximately 1 Gb of data per day, detection and counting of meteor echoes must be carried out automatically. Algorithms using edge method detections on spectrograms will be described. In particular, their performances in terms of small rates of false detections (mainly due to reflection on planes) will be discussed. Initial results obtained with the interferometric system will also be presented.