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Observation of the 2012 Geminids shower, and trial of meteor detection

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Observation of meteors and meteor trains with a high sensitivity digital single-lens reflex camera was performed at Kiso observatory, University of Tokyo, form 13h43m to 20h39m UT on December 13, 2012. Single station observation was carried out there by using Nikon D3 and D4 digital cameras with lenses of 28 mm, f/1.4. The camera setting was ISO=25,600, shutter speed 1/1.3 seconds (0.769 s) with an interval of 1 s. As long as the capacity of CF cards allowed, continuous shooting of 1/1.3 s exposures was performed, resulting 24,868 frames recorded on Dec. 13. All of the images were checked frame by frame by viewing manually on the screen of PC, and meteors and relating meteor trains were picked up on the successive images. Many meteors and their meteor trains which belong to the Geminids was successfully detected from these images. Magnitude of the meteors and the meteor trains were determined in comparison with a star chart for visual meteor observation. The magnitude of a meteor and its meteor train is not absolute magnitude, but the apparent magnitude. The meteor train was divided into three parts and assumed the each range the upper end, the center, the bottom end, from the appearance side. The brightest part was determined from the three parts for each meteor and meteor train.

The number of appearances of the green short-duration meteor trains which is considered to be luminescence of OI 557.7 nm is counted. Observation of the meteor and meteor train by a high sensitivity digital single lens reflex camera was started in December, 2007. According to the peak day of main meteor showers, it is observing after it. Furthermore, development of an automatic meteor detection software which can discover a meteor from the huge number of pictures taken by quick repetition is also introduced in this paper.

Reference

[1]Masayuki Toda, Masa-yuki Yamamoto, and Yoshihiko Shigeno, Measuring of short-duration meteor trains: altitude distribution of luminescence by double-station meteor observation with image intensified video cameras, Proceedings of Kochi University of Technology, Vol. 7, No. 1, 45-55, 2010.
(in Japanese, English Abstracts)

[2]Masayuki Toda, Observation of the a meteor train with the high sensitivity digital single-lens reflex camera, The Astronomical Herald, Vol.105, No.11, 716-718, 2012.
(in Japanese, Astronomical Society of Japan)

Keywords: Geminids, Meteor, Meteortrain, Meteor auto-detection software