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Meteor observations of the Perseids 2015 using the SPOSH cameras

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Abstract

We will organize a meteor campaign in Greece focusing on the observation of the meteor activity during this year's maximum of the Perseids meteor shower. Double-station observations will be carried out from 10^{th} until 14^{th} of August using SPOSH cameras. During this period, we anticipate rates up to 100 Perseids per hour. The participation of graduate students during the observations and the data reduction will strengthen the educational aspect of the campaign.

1 Introduction

Perseid meteors occur every year when the Earth crosses the orbital path of the comet 109P/Swift-Tuttle on August 12-13. Near the peak, Perseids reach a Zenithal Hourly Rate of 100, with even stronger activity sometimes observed for instance during the perihelion passage of the comet in 1992 with recorded ZHRs of a few hundreds [3]. Perseids are among the few meteor showers producing such a high number of meteors every year, owing to the long lifetime of the parent body and its stable orbit.

2 Observations

The meteor observations will be carried out between the 10^{th} and the 14^{th} of August with the shower maximum occuring in the early hours on the 13^{th} of August. Two observing sites will be equipped with a *Smart Panoramic Optical Sensor Head* camera system [4]. The SPOSH cameras have been designed to image short-lived phenomena under low light conditions which makes them ideal for observing meteors. Similar to all-sky cameras, the custom-made wide angle lens system of the SPOSH offers a 120° rectangular field-of-view. The observing sites are ideally located on mountainous areas with the nearest cities being ~20 km away. This ensures a sufficiently dark sky which allows the camera to detect up to +9 magnitude stars. Meteor observations around the Perseids maximum will benefit from the new Moon on the 14^{th} of August.

3 Data Reduction

The data acquired during the observing campaign will be processed using software developed at the Technical University of Berlin (TUB) and the German Aerospace Center (DLR). The calibration software uses stars presented in the images with their positions known from star catalogs to compute the orientation of the camera in space [2]. Then a detection algorithm searches all the images for meteor-like features. Finally, the trajectories of meteors recorded from both stations are determined using standard methods [1]. The velocity of a meteor is computed with the help of a rotating shutter which is mounted in front of the camera lens for the estimation of the meteor duration. Using this additional information, the heliocentric orbit of the meteoroid is also calculated.

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