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Meteor observations of the Perseids 2014 using the SPOSH cameras

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Abstract

We will organize a meteor campaign in Greece focusing on the observation of the Perseid meteor shower. Double-station observations will be carried out from 30^{th} of July until 3^{rd} of August using SPOSH cameras. During this period, we anticipate rates of approximately 15 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 the 12^{th} of August. Around the peak hours, Perseids reach a Zenithal Hourly Rate of 100, with a few exceptions being 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, owning to the long activity of the parent body and its stable orbit. Although, there are many meteor observations during the peak of the shower, less is known regarding the shower's activity before and after the peak. We wish to cover the relatively long activity of the shower with photographic observations, which will help us understand the formation and evolution of the Perseids.

2 Observations

The meteor observations will be carried out prior to the shower maximum between 30^{th} of July and 3^{rd} 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 ~20km away. This ensures a sufficient dark sky with up to +6 magnitude stars being visible with the naked eye on a clear moonless night. This year the waxing crescent Moon will set around midnight on our last observing day.

3 Data Reduction

The data acquired during the observing campaign will be processed using software developed at TUB and DLR. The calibration software uses stars depicted 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 detected on both stations at the same time can be computed using the method described by Ceplecha [1]. The apparent velocity of a meteor can be found with the help of a rotating shutter in front of the camera lens. Using this additional information, the heliocentric orbit of the meteoroid can be also calculated.

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