

A drone-borne installation for studying the composition of cosmic rays in the range of 1-1000 PeV by registering the reflected Cherenkov light of EAS

Wednesday, 21 July 2021 13:18 (12 minutes)

Here we present the current technical design of the SPHERE project's new detector. The SPHERE project is aimed at primary cosmic ray studies in the 1-1000 PeV energy range using reflected Cherenkov light. The concept of a drone-mounted detector with a photosensitive camera based on silicon photomultipliers is discussed. The combination of the reflected CL registration method with specific data analysis approaches is a unique feature of this project. The developed earlier event-by-event data analysis approach allows to carry out primary particle mass reconstruction and PCR mass composition studies with high accuracy. This is achieved through careful analysis of each EAS CL lateral distribution function without building any kind of intermediate distributions of any "typical" characteristics.

Keywords

cosmic rays; extensive air showers; cherenkov light; high energy cosmic rays

Collaboration

other Collaboration

Subcategory

Experimental Methods & Instrumentation

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Session Classification: Discussion

Track Classification: Scientific Field: CRI | Cosmic Ray Indirect