Contribution ID : **1070** Type : **Oral**

Detection of air showers with Geiger-APDs

Monday, 9 July 2007 11:42 (0:12)

Abstract content

We have detected Cherenkov light from air showers with Geiger-mode APDs (G-APDs). G-APDs are novel semiconductor photon-detectors which offer several advantages compared to conventional photomultiplier tubes in the field of air shower detection. Folded with the Cherenkov spectrum the response of G-APDs is up to a factor of three higher if compared with classical photomultipliers. Moreover they offer high gain (˜10ˆ5-10ˆ6) at low operation voltages (<100 V). Under operation they can withstand excessive and prolonged exposure to bright light and are also mechanical robust. Dark count rates of some G-APDs are below the level of light coming from the night sky. Furthermore G-APDs can be mass-produced which allows to considerably reduce the costs of these sensors. According to the present state of the development of G-APD they promise to be a major progress for gamma-ray astronomy.

Here we report on the detection of Cherenkov light from air showers with G-APD. We discuss first test results and the advantages and problems of G-APDs in Cherenkov telescopes.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 3 (OG part 2), pages 1523-1526

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Session Classification : OG 2.7

Track Classification : OG.2.7