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High performance measurement system of large area solid-state track

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Abstract content

The handling of solid-state track detector (SSTD) has been historically required for a long period and many human powers to scan and analyze etch-pits produced on the detector. Because a large area greater than a few m^2 detector is required to observe ultraheavy nuclei in galactic cosmic rays, a high speed scanning system is practically important to realize our observation. We have developed the fast automated digital imaging optical microscope (HSP-1000) to scan and analyze the etch-pit produced on the detector, whose image acquisition speed is 50-100 times faster than conventional microscope system. Furthermore, analyzing massive cosmic ray track data produced in extremely large exposed area requires a completely automated multi-sample scanning system. The developed automated system consists of a modified HSP-1000 microscope for image acquisition, a robot arm to replace the sample trays, a magazine station for storing sample trays, and a scanning and analyzing computer to control the whole system. Moreover, since the improvement of thickness measurement accuracy in local area of SSTD will allow us to achieve higher charge and mass resolutions, the new system to measure the SSTD thickness located adjacent to etch-pit in SSTD with an excellent resolution of +/- 0.2 um has been developed.

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. 2 (OG part 1), pages 429-432

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