

加速器

Monitoring the energy variation of an electron linac using a Cerenkov detector

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收稿日期 2009-2-13 修回日期 2009-4-1 网络版发布日期 2009-12-9 接受日期 2009-12-9

摘要

A new method to monitor the energy variation of a multi-energy electron linac by combining a Cerenkov detector and a CsI(Tl) detector is reported. The signals in the Cerenkov detector show an appreciable but different dependence on the energy of the electron linac from the traditional CsI(Tl) detector due to the particular response of the former to charged electrons with high velocity above threshold. The method is more convenient than the HVL (half-value layer) method which is commonly employed to calibrate the energy of an electron linac for real time monitoring. The preliminary validity of the method is verified in a dual-energy electron linac with 6 MeV and 3 MeV gears. Moreover, the method combining the Cerenkov detector and the CsI(Tl) detector is applicable to probe the X-ray spectrum hardened by the inspected material and may serve as a novel tool for material discrimination with effective atomic number in radiation imaging.

关键词

[electron linac, Cerenkov detector, Geant4](#)

分类号

DOI:

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