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## 窄束X射线半价层测量法标定电子直线加速器的能量

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收稿日期 2002-6-3 修回日期 网络版发布日期:

**摘要** X射线半价层测量法是一种常用的低能电子直线加速器能量标定方法,本文对窄束X射线半价层的测量方法进行了讨论。利用Monte Carlo程序MCNP4B对窄束X射线半价层进行了计算和分析,并与实测数据进行了比较,测量数据与MCNP4B计算结果符合得很好。此外,还讨论了准直锥的长度和材料、准直缝的尺寸、靶的厚度和材料等因素对半价层的影响。

关键词 [半价层](#) [窄束](#) [宽束](#) [MCNP4B程序](#)

分类号 [TL53](#)

## Calibration of the Energy of an Electron Linac by Measuring the Narrow-beam X-ray Half-value Layer

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**Abstract** The half value layer(HVL) of the broad beam X ray is often used to calibrate the energy of an electron linac, but in some cases the measurement of the broad beam X ray HVL is not convenient. Therefore, the measurement of the narrow beam X ray HVL as a method to calibrate the energy of an electron linac is discussed in the paper. The Monte Carlo code, MCNP4B is used to calculate and analyze the narrow beam X ray HVL, meanwhile the narrow beam X ray HVLs are measured for the 2.5,4,6 and 9 MeV electron linacs. There is a good agreement between the measured HVLs and the MCNP4B calculated results. Also, the length of a primary collimator, the width of a collimator slot, the thickness of a target and such other factors' influence on HVL is discussed, and some useful suggestions are given to reduce the measuring errors of the narrow beam X ray HVL used to calibrate the energy of an electron linac.

**Key words** [half-value layer](#) [narrow-beam](#) [broad-beam](#) [MCNP4B code](#)

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