

电子直线加速器束截面测量系统及其应用

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摘要 用于北京自由电子激光 30MeV电子直线加速器的注入及输出束的截面监测系统,由可伸缩荧光屏束截面探头、摄像取样装置及图象采集卡和计算机处理系统构成。用此系统测量加速器注入($\leq 1.2\text{MeV}$)和输出($\geq 20\text{MeV}$)电子束的截面宽度、密度分布、发射度等参量。其硬件的空间分辨率好于 $110\mu\text{m}$,束宽测量精度好于 $50\mu\text{m}$ 。经加速器在线使用2年以上考验,性能可靠,得到了满意结果。

关键词 [加速器](#) [束截面](#) [荧光屏](#) [图象](#)

分类号

BPM SYSTEM OF ELECTRON LINAC AND IT'S APPLICATION

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Abstract The beam profile measurement (BPM) system of 30 MeV linac in Beijing Free Electron Laser Laboratory (BFELL) is described. The BPM consists of remote control phosphor screen, four TV cameras, an image video signal processor and a computer system. The profile, position, emittance and distribution of electron beam for injection and output of the linac have been measured with it. The spatial resolution of the system is approximately 0.1 mm. The precision of measurement of beam width is about 0.05 mm that meets the requirement of BFEL. The system have been used on line over two years and have met the needs for test of BFEL.

Key words [Accelerator](#) [Beam profile](#) [Phosphor screen](#) [Image](#)

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