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技术及应用

单离子束加速器终端电压控制系统的改进设计

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摘要 设计采用旋转伏特计（GVM）控制方式稳定单离子束加速器终端电压。分析了GVM控制方式控制终端电压的原理,设计了陷波器、低通放大器、精密整流滤波、带通滤波器、误差放大器等信号处理电路。陷波器采用中心频率为50 Hz的双T型，带通滤波器为非对称结构，中心频率为35 Hz，带宽为50 Hz。控制电路输出0～10 V的控制信号，以控制电晕针放电。测试结果表明，采用该控制系统加速器长时间运行的电压稳定度＜1%。

关键词 单离子束加速器；终端电压稳定性；旋转伏特计

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Design for Improving Terminal Voltage Stability With Generating Voltmeter Control in Single Ion Accelerator

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Abstract A terminal voltage control system with a generating voltmeter （GVM） for the single ion accelerator was designed. The principle of the control method was analyzed. The circuit consisting of a notch filter, a pass-filter, a rectifier filter, a band filter and an error amplifier was designed and made. The notch filter was designed in TT-type with the notch frequency of 50 Hz. The band filter was designed in asymmetric type with the band frequency of 35 Hz and band width of 50 Hz. The output voltage of the controlling circuit was set to 0-10 V which controlled the corona discharge current. The instability of the terminal voltage is tested to be less than 1%.

Key words single ion accelerator _ terminal voltage stability _ generating voltmeter

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