

技术及应用

阻抗板探测器工作电压和时间分辨率的测量及分析

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摘要 在不同工作电压下对阻抗板探测器 (resistive plate chamber, RPC) 的信号进行了测试, 并根据信号幅度的大小和形状判断出产生雪崩信号和流光信号的电压区域。研究了气体成分和工作电压对RPC时间分辨率的影响。时间分辨率随电压的增加先下降后上升, 时间分辨率有最低点, 随SF₆气体比例的增加, 时间分辨率最低点的电压向前移动了200 V。当电压为 10.2 kV、φ(SF₆)=1.3%时, 时间分辨率有最理想值。

关键词 [阻抗板探测器](#); [雪崩信号](#); [流光信号](#); [时间分辨率](#)

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Test and Analysis of Operation Voltage and Time Resolution of Resistive Plate Chamber

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Abstract The signals from the resistive plate chamber (RPC) were tested under different operation voltages. According to the amplitude and shape of the signals, the operation voltages for avalanche signals and streamer signals were determined respectively. The influence of the operation gas mixture and high voltage on the time resolution was also investigated. The time resolution first decreases with the increase of voltage and then goes up again. There is a minimum value of time resolution. The minimum of time resolution shifts forward for 200 V with the increase of the ratio of SF₆. At voltage 10.2 kV and φ(SF₆)=1.3%, the time resolution reaches its optimized value.

Key words [resistive plate chamber](#) [avalanche signal](#) [streamer signal](#) [time resolution](#)

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