Contribution ID: **65** Type: **Poster**

Test beam results of micro channel plates in ”ionisation mode” for the detection of single charged particle and electromagnetic showers

Friday, 29 May 2015 16:50 (0 minutes)

IMCP is an R&D project aimed at the exploitation of secondary emission of electrons from the surface of micro-channel plates (MCP) for fast timing of showers in high rate environments. The usage of MCPs in “ionisation” mode has long been proposed and is used extensively in ion time-of-flight mass spectrometers. What has not been investigated in depth is their use to detect the ionizing component of showers. The fast time resolution of MCPs exceeds anything that has been previously used in calorimeters, and, if exploited effectively, could aid in the event reconstruction at high luminosities. Results from tests with electrons with energies up to 150 GeV of MCP devices with different characteristics will be presented, in particular detection efficiency and time resolution.

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Session Classification: Calorimetry - Poster Session

Track Classification: S9 - Calorimetry