

# Testing timing RPC's at ELBE/Dresden using 32MeV single-electron bunches with picosecond time resolution

*Wednesday, 10 February 2010 17:00 (2 hours)*

In the framework of detector development efforts worldwide, there is an increasing demand for a rapid and reliable way of testing timing RPC's regarding their efficiency and time resolution. One possible avenue to reach this goal is to employ pulsed electron beams of several tens of MeV energy, which are close to the minimum of ionization. The timing response can then be measured with the accelerator RF signal as reference, obviating the need for fast scintillators.

This technique has been used successfully at the 40MeV superconducting electron accelerator ELBE in Dresden, Germany, since several years in the framework of the CBM and NeuLAND collaborations [1, e.g.]. Recently, the MRPC testing capabilities at ELBE have been greatly boosted by the introduction of a new, single-electron per bunch, mode of operation of the accelerator. This new mode of operation allows for the first time to use the primary electron beam, as opposed to scattered beam, for MRPC testing. This leads to much lower background, while electron rates can now vary from 101–107 s<sup>-1</sup> on an exposed region of a few cm<sup>2</sup>. The intrinsic time resolution is  $\sigma \approx 25$  ps. Based on this upgrade, a new RPC testing station has been constructed at ELBE. This station will be presented in the poster, together with some recent results obtained there.

The MRPC testing station and the ELBE accelerator are open to the worldwide scientific community as a user facility, with proposals collected every six months and evaluated based on their scientific merits.

[1] R. Kotte et al., Nucl. Inst. Meth. A 564, 155 (2006)

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