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Carbon based resistance temperature detectors. Properties and Calibration.

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For proper operation the particle accelerators based on superconductive magnets require a precise temperature monitoring. In this presentation properties of the carbon based resistance temperature detectors (RTD) will be presented, including their behavior in the high magnetic field, which is a crucial parameter for their application in the accelerator monitoring systems.

The calibration process is shown, together with the details on the calibration system designed for this application. The calibration routine, originally prepared for the nuclotron monitoring system only, was optimized for high accuracy of sensors in cryogenic temperatures. The system was rebuilt and is currently based on an 18-bit ADC with an internal MUX and 35 input channels for calibrated resistors and referential sources.

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