

A NEW BEAM LOSS MEASUREMENT SYSTEM For ELBE

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Abstract

During the commissioning of the first accelerator stage of ELBE, beam loss was measured with photomultipliers and self-testing integrating electronics. While the electronics worked flawless, the correct positioning of the monitors and finding a good trade off between sensitivity and saturation of the photomultipliers were a problem. A new BLM system, consisting of ionization chambers, acquisition electronics and monitoring software is now under construction. Coaxial cable with air dielectricum, normally used in high power applications, makes the ionization chamber and will be installed along the beamline. The outer conductor of the cable is subsectioned, the inner conductor not. The current on the inner conductor represents the total beam loss. The current from each outer conductor segment to ground is measured separately, providing position resolution of the beam loss. On each section, a RISC microcontroller (Slave) with built in ADC is used for data acquisition and continuous average calculation. One microcontroller (Master) handles the communication with the slaves via RS-485 bus and acts as an interface to a PC running monitoring software. First test has been done successfully.