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MTCA based BPM system design

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A digital beam position measurement system based on MTCA.4 is designed. The system includes a RF front-end circuit and a digital signal processing module. The RF front-end circuit adjusts the signals from the beam position detectors to meet the requirements of the analog to digital converter. The digital signal processing algorithm is implemented in the FPGA. Multi-rate signal decimation, CORDIC algorithm, difference-over-sum algorithm are implemented in the FPGA.Data on demand at Turn-by-Turn(revolution) frequency(TBT data), fast acquisition data(FA data) and slow acquisition data(SA data) are obtained after the digital signal processing in the FPGA.The hardware system is based on MTCA.4 with high integration and reliable performance and the RF front-end gain can be adjusted through the serial port flexibly.

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