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## Design of AMC board according to MicroTCA.4 for BPM and LLRF application

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Beam position monitors are critical to ensuring that particle beams pass correctly through the various components of an accelerator, especially in high-precision experimental facilities such as colliders and synchrotron radiation sources. In recent years, in order to improve the performance and reliability of BPM systems, electronic systems based on MicroTCA have been widely developed and applied. MicroTCA is an advanced modular electronic platform that supports multiple AMC boards to operate on the same backplane and achieves a high degree of data integration and processing capabilities through high-speed backplane interconnection. In addition, the advanced management functions provided by the MicroTCA platform, such as power management, cooling control and module monitoring, further enhance system reliability and stability. The AMC board core chip developed in this study is based on Xilinx KU060 FPGA and has powerful data processing capabilities; the AMC connector supports Ethernet and 4-lane PCIe Gen3 links; it adopts the Zone3 adapter+dual FMC architecture, which can receive RTM transmission through Zone3 In addition to the signals. It can also directly use the FMC card to receive signals through the AMC front panel, supporting up to 16 channels of 125MHz ADC. In addition to core functions, this AMC board also has a data pre-processing function, which can perform preliminary processing and compression of data before sending it to the MCH.

### Footnotes

### Funding Agency

### I have read and accept the Privacy Policy Statement

Yes

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