



Contribution ID: 559

Type: **Contributed talk**

RF Direct Sampling Processor Brings Revolutionary Progress to Beam Diagnostics

Wednesday 28 August 2024 12:30 (15 minutes)

Analog down-conversion structures have been used for beam diagnostics, especially in the processing of GHz frequency signals such as cavity BPM/BAM and bunch-by-bunch feedback. But the RF front-end module in the structure contains a large number of analog devices, which reduces the system performance, complicates the system, difficult to design and cost much. Digitizing the RF signal directly and processing them in the digital domain has always been our goal. For the first time, we have developed an RF direct sampling processor for cavity BPM/BAM systems in XFEL. The processor bandwidth reaches 6GHz and sampling rate 2.6GSPS, no front-end module needed and gets better performance compared to analog down-conversion structure. This is a stand-alone processor that enables complete cavity pickup signal processing. It can meet the signal processing needs of different of cavity pickups and also can be used in bunch-by-bunch feedback system on synchrotron radiation facility. It brings great progress to the beam diagnostics of XFEL and synchrotron radiation facilities.

I plan to submit also conference proceedings

Yes

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