Contribution ID: **235** Contribution code: **TUP53** Type: **Poster Presentation**

Designed and implemented 128-channel readout electronics based on the CFC

Tuesday, 10 September 2024 16:00 (1h 30m)

To convert weak current signals into voltage pulse signals proportionally, a 128-channel readout electronics system is developed. The front-end analogue circuits of this readout electronics system are designed based on the Charge to Frequency Converter (CFC) circuit structure, and the back-end digital board processes the voltage pulse signals. After the performance test in the laboratory and the beam test in PREF, This system can proportionally convert currents from 1 pA to 1 μA into voltage pulse signals with an input dynamic range of 120 dB. The maximum nonlinear error does not exceed ±10%, and the system's resolution is less than 100 fA. The isolation between the adjacent channels is lower than -114 dB. The system is used not only for beam profile monitoring, but also for the flatness, symmetries and scanning uniformity measurements of slow-extraction beams. The system is of great value in the field of weak beam profile measurements.

Footnotes

Funding Agency

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Yes

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Session Classification: TUP: Tuesday Poster Session

Track Classification: MC4: Transverse Profile and Emittance Monitors