Contribution ID: **894** Contribution code: **THPS112** Type: **Poster Presentation**

An effective method for crossbar-switch interference suppression based on WPT in beam position measurements of HLS II

Thursday 5 June 2025 15:30 (2 hours)

There are 32 electron beam position processors used for beam position measurement in the storage ring of Hefei Light Source(HLS II), the crossbar-switch(CS) of processors must be operation for RF channels compensation and long-term stability. The turn-by-turn(TBT) and fast acquisition(FA) beam position signals would suffer from the CS interference like harmonics and artifact when the CS is operation. In this paper, an effective method based on wavelet packet transform(WPT) is proposed to suppress the CS interference without distorting actual TBT and FA signal. This method starts with the wavelet packet decomposition of the contaminated TBT signal first, then wavelet coefficients are further processed, and finally the processed coefficients of whole subbands are reconstructed through filter banks to obtain the clean TBT signal. As a result, the relatively slow rate of clean and undistorted fast acquisition(FA) signal is obtained through partial reconstruction. Experiment results with real TBT signals demonstrate the effectiveness of the proposed method, and also show that the proposed method does not distort the actual TBT and FA signal while suppressing the CS interference.

Footnotes

Paper preparation format

Word

Region represented

Asia

Funding Agency

Author: TANG, Leilei (University of Science and Technology of China)

Co-authors: SUN, Bao-gen (University of Science and Technology of China); WANG, Dongyu (University of Science and Technology of China); LU, Ping (University of Science and Technology of China); WU, Ruizhe (University of Science and Technology of China); Dr MA, Xiaochao (Budker Institute of Nuclear Physics)

Presenter: TANG, Leilei (University of Science and Technology of China)

Session Classification: Thursday Poster Session

Track Classification: MC6: Beam Instrumentation and Controls,Feedback and Operational Aspects: MC6.T03 Beam Diagnostics and Instrumentation