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LLRF and timing control system based on MicroTCA.4 at SPring-8

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A new injector linac was constructed for the New SUBARU, a 1.5 GeV synchrotron radiation facility, at SPring-8.

The accelerating frequencies used at the new linac are 238, 476, 2856 and 5712 MHz.

The required accuracy is, for example, $8e-4$ at 238 MHz for amplitude and 0.2 degree at 476 MHz for phase.

Also, the master trigger of the linac must be synchronized with both the aimed bucket timing of the storage-ring (SR) and the linac master clock.

To fulfill these requirements, the LLRF and timing control system were developed using the modules of Micro Telecommunication Computing Architecture 4 (MTCA.4) standard.

The operation of the NS has been carried out stably since April 2021 without any significant faults.

Furthermore the MTCA.4 based 509 MHz LLRF system for SPring-8 SR had been developed and replaced from NIM-based LLRF system.

These LLRF and timing systems are also applied to a new 3 GeV light source in Tohoku, named NanoTerasu, which is now under construction.

These development and achievement related to LLRF and timing control system will be reported.

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