

# LLRF upgrade status at the KEK Photon Factory 2.5 GeV ring

*Tuesday, October 24, 2023 11:45 AM (20 minutes)*

In 2023, we will replace the LLRF system for the KEK-PF 2.5 GeV ring. The new system is composed of digital boards such as eRTM, AMC, and  $\mu$ RTM, based on the  $\mu$ TCA.4 standard. For our application, development time and cost were minimized by customizing the LLRF technologies developed for the SPring-8 and J-PARC. In our system, we adopted the non-IQ direct sampling method for RF detection. We set the sampling frequency at  $8/13$  (307.75 MHz) of the RF frequency, where the denominator (13) is the divisor of the harmonic number (312) of the storage ring. This allows us to detect the transient variation of the cavity voltage that is synchronized with the beam revolution. To compensate the voltage variation, we implemented a feedforward technique. These functions will be useful in a double RF system for KEK future synchrotron light source. Production of the new system was complete and we are in the offline testing phase. From July to October, the new system will be installed in the KEK-PF 2.5 GeV ring RF system and various adjustments using klystrons and cavities will be performed. In this presentation, we introduce our new system and report the upgrade status.

## Keyword

**Primary author:** NAITO, Daichi (KEK)

**Co-authors:** Mr MOTOMURA, Arata (KEK); Dr YAMAMOTO, Naoto (KEK); Prof. SAKANAKA, Shogo (KEK); Mr TAKAHASHI, Takeshi (KEK)

**Presenter:** NAITO, Daichi (KEK)

**Session Classification:** Measurement and control

**Track Classification:** Measurement and control