

Latest improvements and results for DC-SC photocathode injector LLRF system at Peking University

The 3.5-Cell superconducting cavity is part of Peking University DC-SC photocathode injector. A digital LLRF system was developed for the stable operating of this injector. As reported before, the stability of the system had achieved $\pm 1\%$ for amplitude and $\pm 0.5^\circ$ for phase at 4K operation. There has been several improvements during our latest 2K experiments. A dynamic configurable SEL/GDR controller was implemented in the FPGA. A hardware UDP core for high speed signal transmission was add to the system. This core allows us to real-time monitor and analyze various signals at sample rate $> 1\text{MSPS}$. And there was some minor improvements to the control algorithm that allows the system to run in pulse mode. In our latest 2K experiments, the LLRF system has achieved long time ($> 2\text{h}$) amplitude stability of $\pm 0.5\%$ and phase stability of $\pm 0.3^\circ$.

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