

Low-level radiofrequency system upgrade for the Dalian Coherent Light Source

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DCLS (Dalian Coherent Light Source) is an FEL (Free-Electron Laser) user facility at EUV (Extreme Ultraviolet). The primary accelerator of DCLS operates at a repetition rate of 20 Hz, and the beam is divided at the end of the linear accelerator through Kicker to make two 10 Hz beamlines work simultaneously. In the past year, we have completed the upgrade of the DCLS LLRF (Low-Level Radiofrequency) system, including setting the microwave amplitude and phase for two beamlines based on event timing, optimizing the microwave stability, and generating microwave excitation with the arbitrary shape of amplitude and phase. We added two special event codes and a repetition rate division of 10 Hz in the event timing system and set the microwave amplitude and phase by judging the event code in LLRF. The amplitude and phase stability of the microwave was improved with an intra-pulse feedforward algorithm. In addition, we have also generated microwave excitation with arbitrary amplitude and phase shapes to meet the dual beam operation in the future. Detailed information on functions or algorithms will be presented in this workshop.

Keyword

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