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LLRF algorithm for superconducting cavities in SHINE

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A LLRF cavity control system has been designed in Shanghai High Repetition Rate XFEL and Extreme Light Facility (SHINE) project to ensure its rf field stability. The system employs non-IQ sampling and uses two driven modes in amplitude /phase control, namely, the Self-excited Loop (SEL) and the Generator Driven System (GDR). Additionally, each cavity is tuned with a Piezo actuator and a slow stepper motor. Moreover, the measurement and compensation of microphonics have been considered. In the test, we have detected a potential source of disurbances at 50Hz and we attempt to suppress it. The LLRF control algorithm is currently being optimized, and this paper provides an overview of its design and development.

Keyword

SHINE、control、algorithm、microphonics

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