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Superconductive cavity driving with FPGA controller

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The LLRF –Low Level Radio Frequency cavity control system is still under development in order to regulate accelerating fields of the superconductive resonators. The first testing of the cavity driving applying the FPGA (Field Programmable Gate Array) technology have been carried out in DESY Hamburg. The experiments focused attention to the general recognition of the cavity features and projected control methods. The electrical model of the resonator is taken as a consideration origin. The calibration of the signal channel is considered as a key preparation for an efficient cavity driving. The identification of the resonator parameters is confirmed as a proper approach for the required performance: driving on resonance during filling and field stabilization during flattop time with reasonable power consumption. The feed-forward and feedback modes were applied successfully for the CHECHIA cavity and ACC1 module driving. Representative results of experiments are presented for different levels of the cavity field gradient.

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