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Design and Implementation of a Digital Tuning System for 50 MHz Cavities

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At PSI, the high intensity proton accelerator (HIPA) delivers a proton beam of 590 MeV energy at a current of up to 2.4 mA. The RF cavities are operated in CW mode at a frequency of 50 MHz. The initial system was built about 30 years ago with the technology at that time which was predominantly analogue. With the modern replacement of the analogue system, the cavity operation and maintenance will be improved remarkably. Seamless integration to the control system (EPICS) will represent another advantage. Exception handling or additional operation modes are much easier to implement with the digital approach. This poster focuses predominantly on the design and implementation of the digital tuning system. First measurement results show the ability to tune the cavity.

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