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BESSY-II new digital mTCA.4-based LLRF control for the booster upgrade

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In the framework of the BESSY-VSR upgrade, the beam injection from the booster to the storage ring has to be modified in order to inject shorter bunches. For this purpose, a new PETRA-type 5 cell cavity has been installed in the booster ring and a second one is to be installed. These two new normal conducting 500MHz cavities are to be powered by two already installed and tested 80kW Solid State Amplifiers, which will be driven by a new digital mTCA.4-based LLRF system.
The so-called "single cavity"firmware developed by DESY is being used together with the ChimeraTK adapter to connect the mTCA to the EPICS control system. The chosen hardware to implement the control loop is a pair of SIS8300KU and a DWC8VM (low frequency version), while the tuner is driven by a PhyMotion chassis connected to the EPICS system as well. In order to commission the LLRF system, a test-stand has been set up comprising a HOM-damped 500MHz cavity, a 80kW SSA, a mTCA crate and a PhyMotion crate. Once the system is tested and debugged, it will be deployed to driven the new booster cavities.

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