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Precision X-band RF control system

The new PolariX TDS cavities developed in cooperation between DESY, PSI and CERN require X-band RF frontends for the measurement of the 12 GHz electric fields. The cavity, waveguide and klystron signals will be downconverted from 12 GHz to 3 GHz and further processed in a standard 3 GHz S-band RF control system based on MicroTCA.4. In this poster, we will present the 9 GHz LO generation method and measurements of the 12 GHz frontend prototype setup. Preliminary results have shown a short-term jitter of about 2.5 fs rms for the LO generation and 2.5 fs rms resolution for the X-band downconversion. Further steps concern the PCB integration as well as the discussion of the 19" chassis packaging.

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