Precision X-Band RF control system

Thursday 27 September 2018 15:30 (1h 30m)

The new PolariX TDS cavities developed in cooperation between DESY, PSI and CERN require X-Band RF front-ends for the measurement of the 12 GHz electric fields. The cavity, waveguide and klystron signals will be down-converted 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 front-end prototype setup. Preliminary results have shown a short-term jitter of about 1.1 fs rms for the LO generation and 1.1 fs rms resolution for the X-Band down-conversion. Further steps concern the PCB integration as well as the discussion of the 19[°] chassis packaging.

Summary

This poster shows the project status of the X-Band LLRF system. It gives an overview of the latest results, current field of work as well as an outlook to upcoming tasks and possible problems that might occur.

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Session Classification: Poster Session

Track Classification: SYNCHRONIZATION AND CONTROL