

FPGA based LLRF Systems for Fermilab's High Intensity Neutrino Source

Tuesday 18 October 2011 17:20 (20 minutes)

Two LLRF systems were designed and built for the HINS program at Fermilab. The first system is used in Horizontal Test Stand for commissioning and testing of 325 MHz SRF spoke resonators. The second one is for HINS 6-cavity test accelerator with ferrite vector modulators used in a high power distribution scheme from a single klystron. In addition to standard LLRF functions, each of the systems is characterized by some unique capabilities. The HTS system has a novel resonance frequency tracking system, which may be operated in both CW and pulsed modes. And it also has built-in a real-time cavity simulator with parameterized resonance frequency and loaded Q. HINS6 LLRF provides ferrite vector modulator control on each of six cavities in the system. The nonlinear control space and initial results will be described.

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Session Classification: Session 7