



Contribution ID: 9

Type: poster

LLRF system within the framework of the R&D of supraconducting SPOKE cavities

Tuesday 11 October 2005 09:59 (3 minutes)

Within the framework of the current European research programs EUROTRANS and EURISOL on High Intensity Proton Accelerators, and particularly on the R&D on superconducting SPOKE cavities, a Low Level Radio Frequency Digital system is developed at IPN Orsay in collaboration with LPHNE Paris, both IN2P3-CNRS laboratories.

Due to Lorentz's forces, mechanical vibrations or RF power perturbations, the amplitude and phase of the electromagnetic wave inside the cavities need to be controlled. Other goals are a better reliability, a high level of integration and a fast response time of the feedback control system. Digital techniques should allow to meet all of these goals and provide an improved flexibility compared to analog techniques, with the integration of the main algorithms and functions into an FPGA. The main design options and some preliminary results are presented.

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Session Classification: Poster Session with Author Participation