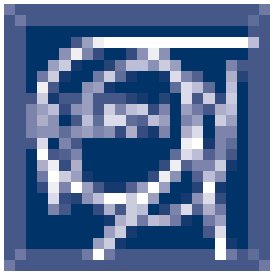

Contribution ID: **31** Type: **oral mini talk**

LANSCE-R Low Level RF Control System

Tuesday, 11 October 2005 14:07 (7 minutes)

The Los Alamos Neutron Science Center (LANSCE) proton accelerator is scheduled for refurbishment starting in FY06. A new low level RF (LLRF) system is part of the refurbishment plan since the existing LLRF system is analog-based and requires significant setup and maintenance time. Both field and resonance control aspects of the current system do not have the flexibility to meet future performance requirements. The LANSCE accelerator provides both H+ and H- beams and due to the various user requirements there are a number of different beam pulse types varying in timing and current. In order to meet user needs, LANSCE must simultaneously transport both H+ and H- in the accelerator. These requirements have motivated the development of a new LLRF system based on soft radio technology. The new system will include field control using feedback and adaptive feed forward techniques, an upgraded resonance controller with frequency agility to improve startup and fault recovery times and a high power amplifier pre-compensation controller for improved cavity fill times and amplifier efficiency. Among the challenges with implementing the new system are interfacing with existing subsystems of the accelerator.

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Session Classification: Working Group 3