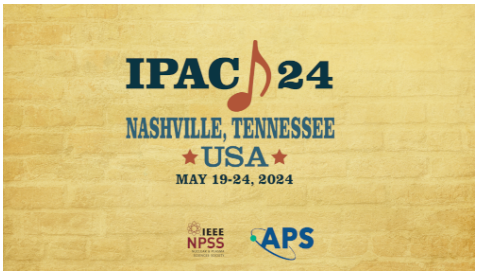

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Future directions for RF buncher at LANSCE proton storage ring

Tuesday, 21 May 2024 16:00 (2 hours)

Los Alamos Neutron Science Center (LANSCE) is designing a Proton Storage Ring (PSR) refurbishment as part of the proposed LAMP project. An important component of this is the ring RF bunching system at h=1 for one circulating bunch. It has operated with high availability since an upgrade was installed in 1999 to raise the gap voltage*. A second RF system at h=2 is planned to improve the bunching factor, reducing the peak beam current at the center of the bunch resulting from space charge forces, helping mitigate effects of electron cloud and leaving an avenue for circulating two bunches in the future. The unique low output impedance RF system for h=1 is based on a cathode follower configuration using push-pull triode vacuum tubes. This feature provides automatic beam loading compensation without active feedback or feedforward systems. The triodes are no longer produced, and suitable replacements are unavailable. The ferrite rings of the h=1 system are also obsolete. Our goals include determining a suitable replacement amplifier configuration that can work on either frequency, and developing a replacement resonator for each harmonic that uses current production ferrite material.

Footnotes

- J. Lyles, J. Davis, "Improvements to the Cathode-Follower RF Amplifier System for the LANSCE PSR Buncher", Proc. PAC'99, New York, pp. 1001-3.

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Primary author: LYLES, John (Los Alamos National Laboratory)

Co-authors: UPADHYAY, Janardan (Los Alamos National Laboratory); HALL, Wesley (Los Alamos National Laboratory); SANCHEZ BARRUETA, Maria (Los Alamos National Laboratory)

Presenter: LYLES, John (Los Alamos National Laboratory)

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