The Beams and Applications Seminar Series

Development of the Superconducting 3.9 GHz cavities at Fermilab

Dr. Nikolay Solyak – FNAL

Bldg. 401, Room B2100
Friday, May 21, 1:30 PM

Host: A. Zholents, ASD

A 3.9-GHz 3rd harmonic superconducting RF system was proposed at DESY to increase the peak bunch current by linearizing the accelerating voltage before the bunch compressor at the FLASH Free Electron Laser user facility in Hamburg, Germany. As a member of the FLASH collaboration, Fermilab developed and built a number of 9-cell cavities and all auxiliaries. All cavities demonstrated high accelerating gradients of ~25 MV/m in vertical and horizontal tests, well above the DESY specification of 14 MV/m. Finally, one cryomodule containing four (4) 3rd harmonic cavities was assembled at Fermilab, sent to DESY, successfully tested in DESY's cryomodule test stand, and installed at the FLASH facility. The Fermilab design was accepted for 3rd harmonic cryomodules, which are planned to be installed in the XFEL.

In this seminar, concepts and designs of the cavity, HOM couplers, power coupler, frequency tuner, and other components of the 3.9-GHz system will be presented. We will discuss results of the high-gradient tests of the cavities and couplers, together with studies of higher-order modes and other major phenomena limiting cavity performance (such as thermal breakdown and multipactoring).

For more information visit

http://aps.anl.gov/News/Meetings/Beams_and_Applications_Seminars/

Visitors from off-site please contact Carmen Nolasco (mnolasco@aps.anl.gov, 630-252-6159) to arrange for a gate pass.