

Abstract Submitted
for the APR05 Meeting of
The American Physical Society

Barrier RF Stacking in the Fermilab Main Injector HAI ZHENG, D. MICHAEL, California Institute of Technology, W. CHOU, J. GRIFFIN, J. MACLACHLAN, K.-Y. NG, D. WILDMAN, Fermi National Accelerator Laboratory, Y. MORI, A. TAKAGI, KEK — A novel wideband RF system, nicknamed “Barrier RF,” has been designed, fabricated and installed in the Fermilab Main Injector. The cavity is made of seven Finemet cores, and the modulator made of two bipolar high-voltage fast solid-state switches. The system can deliver ± 7 kV square pulses at 90 kHz. The main application is to stack two proton batches injected from the Booster and squeeze them into the size of one so that the bunch intensity can be doubled. This increased intensity will be of significant benefit to experiments like MINOS in which the 120 GeV Main Injector beam is extracted into the NuMI beam line to generate neutrinos. High intensity beams have been successfully stacked and accelerated to 120 GeV with small losses. The problem of large longitudinal emittance growth is the focus of the present study. An upgraded system with two barrier RF cavities for continuous stacking is under construction. This work is part of the US-Japan collaborative agreement.

Jon Urheim
Indiana University

Date submitted: 18 Jan 2005

Electronic form version 1.4