

New Beam Position Monitor System Design for the APS Injector*

Robert M. Lill, O. Singh, N. Arnold
Argonne National Laboratory, 9700 S. Cass Avenue, Argonne, IL 60439

Abstract

Demands on the APS injector have evolved over the last few years to the point that an upgrade to the existing BPM electronics is required. The injector is presently being used as the source for both the low-energy undulator test line (LEUTL) project and the top-up mode of operation. These new requirements and the fact that many new rf receiver components are available at reasonable cost make this upgrade very desirable at this time. The receiver topology selected is a logarithmic processor, which is designed around the Analog Devices AD8313 log amplifier demodulation chip. This receiver will become the universal replacement for all injector applications measuring position signals from 352 to 2856 MHz with minimum changes in hardware and without the use of a downconverter. The receiver design features integrated front-end gain control and built-in self test. The data acquisition being considered at this time is a 100-MHz, 12-bit transient recorder digitizer. The latest experimental and commissioning data and results will be presented.

*Work support by U.S. Department of Energy, Office of Basic Energy Sciences, under Contract No. W-31-109-ENG-38.