

ENHANCEMENTS TO THE DIGITAL TRANSVERSE DAMPERS AT THE BROOKHAVEN AGS

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Abstract

Since 1993, a digital transverse damper system has been used at the Brookhaven Alternating Gradient Synchrotron (AGS). The dampers are used to damp coherent and injection errors in both planes for protons and all species of Heavy Ions. Over nine years, several AGS improvements, the addition of the Relativistic Heavy Ion Collider (RHIC) operations, and our experience, created a critical need to improve the original system. Several enhancements have been made to the digital electronics including compatibility with harmonic numbers up to 24, an increase in the system resolution from eight to ten bits, and the conversion of the system interface to VME. The analog electronics were also modified to appropriately interface with the new digital electronics, as well as to provide an overall functional improvement. The pick-up electrode (PUE) preamplifiers were redesigned to decrease the radiation susceptibility of the electronics. The concepts of the AGS Damper system can be utilized in developing a solution for the transverse damping requirements in RHIC.