SPILL SERVO CONTROL BY DSP

J. Kishiro, KEK High Energy Accelerator Research Organization; K. Marutsuka, KEK High Energy Accelerator Research Organization; H. Nakagawa, KEK High Energy Accelerator Research Organization; H. Sato, KEK High Energy Accelerator Research Organization; M. Shrakata, KEK High Energy Accelerator Research Organization; K. Mochiki, Musashi Institute Of Technology; K. Onoue, Musashi Institute Of Technology; H. Tanaka, Musashi Institute Of Technology

A feasibility study of the Digital Signal Processor (DSP) is now under going at KEK 12GeV proton synchrotron. The DSP is expected as a new stand alone processor for a feedback system in an accelerator. For the DSP test, we chose the slow extraction spill servo control, because the current available sampling rate of the DSP, 700 k samples/sec, is matched to the frequency range required to that control. The spill control is fundamentally performed by feedback the ripple component to the beam extraction system, consisting of three kind of quadrupole magnets. The beam intensity and extracted beam spill signal are digitized and feed into the DSP. And the DSP processes the digitized signal according to the transfer function in the spill servo control system so as to compensate the fluctuation in the spill and intensity of the extracted beam. We are now investigating the architecture of the DSP application in the accelerators and describe some sample performances in this conference.