

**Power Supply Ramp Control in the APS Booster Synchrotron**\*, J.A. CARWARDINE and

S.V. MILTON, Advanced Photon Source, Argonne National Laboratory - The acceleration cycle of the Advanced Photon Source (APS) booster synchrotron is completed within 230 ms and is repeated at 2 Hz. During the acceleration period the beam energy increases by as much as 23.3 to a final energy of 7 GeV. The quadrupole and sextupole power supply currents must properly track that of the dipole power supply if the beam is to remain stable during acceleration. In order to meet the performance specifications, a monitoring system, on-line with the main control system, is used to measure machine performance and adapt power supply reference waveforms from cycle to cycle. The system optimizes the tracking between the power supplies thus minimizing transient effects and taking care of any slow drifts. The details of our on-line tuning algorithms are described and actual system performance, as measured using beam and power supply monitoring, is evaluated. Practical considerations are also discussed.

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