

Random and Systematic Field Errors in the SNS Ring: A Study of Their Effects and Compensation*, C.J. GARDNER, BNL - The Accumulator Ring for the proposed Spallation Neutron Source (SNS) [1] is to accept a 1 ms beam pulse from a 1 GeV Proton Linac at a repetition rate of 60 Hz. For each beam pulse, 10^{14} protons (some 1000 turns) are to be accumulated via charge-exchange injection and then promptly extracted to an external target for the production of neutrons by spallation. At this very high intensity, stringent limits (less than two parts in 10,000 per pulse) on beam loss during accumulation must be imposed in order to keep radiation due to activation of ring components at an acceptable level. To stay within the desired limit, the effects of random and systematic field errors in the ring require careful attention. This paper describes our studies of these effects and the magnetic corrector schemes for their compensation.

- [1] W.T. Weng, et. al., "Accumulator Ring Design for the SNS Project", Proceedings of the 1997 Particle Accelerator Conf., Vancouver, B.C., Canada, May 12-16, 1997