

**The Amplitude Dependent Spin Tune and the Invariant Spin Field in High Energy Proton Accelerators**, D.P. BARBER, M. VOGT, DESY; G.H. HOFFSTATTER, Technical University of Darmstadt - There is some ambiguity in the definitions and use of the concepts of spin tune and spin-orbit resonance on synchro-betatron orbits. In this paper we clarify these issues and provide numerical illustrations of the internal consistency of our definitions using the computer code SPRINT for HERA and RHIC with various Siberian Snake arrangements. In addition we study polarization loss on accelerating through resonances. Furthermore, we demonstrate the calculation of the invariant spin field using adiabatic anti-damping of the orbital motion and compare with the spin field obtained by stroboscopic averaging.