Second Order Spin Dynamics Study for RHIC,
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At the RHIC project, polarized proton beams will be accelerated from 25 GeV to 250 GeV. To avoid the depolarization during the acceleration and colliding experiments, a pair of Siberian snakes will be installed in each ring. To analyse the depolarizing phenomena, we set up the equations of motion of 9-D, spin (3D) and particle motion (6D) in magnetic system, namely in dipole, quadrupole, sextupole, octupole, decapole magnet and helical magnet as Siberian snake. After the tracing of orbit motion and spin motion, we construct the second order transfer matrix in each magnet. For the arrangement of magnetic system following the lattice of RHIC, we obtain the depolarization resonance strength and frequency as a function of beam energy. In this paper, we will report the numerical results as well as the formulation of second order transfer matrix.