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RHIC: the world's first high energy polarized proton collider[1]

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The Relativistic Heavy Ion Collider (RHIC) at BNL has been providing polarized proton collisions at a beam energy of 100 GeV since 2001. As the world's first polarized proton collider, RHIC is designed to collide polarized protons at a maximum beam energy of 250 GeV and provides a unique opportunity to measure the gluon contribution to the spin of the proton and to study the spin structure of the proton. Unlike other high energy proton colliders, the added challenge for RHIC is to fight the various mechanisms in an accelerator that can lead to partial or total polarization loss due to the interaction of the spin vector with the magnetic fields. In RHIC, two Siberian snakes have been employed to avoid the spin depolarizing resonances driven by vertical closed orbit distortions and vertical betatron oscillations. Currently, polarized proton beams have been accelerated to 100 GeV without polarization loss. Some depolarization has been observed during acceleration from 100 GeV to 205GeV. This talk will report on the progress of the RHIC polarized proton program. Depolarizing mechanisms in RHIC will also be discussed.

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