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Status of eRHIC RCS Injector Design

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We present the progress and approach of the eRHIC RCS electron injector development. The RCS is designed to deliver 5, 10 and 18 GeV polarized electrons to the eRHIC storage ring. The approach involves using a special symmetry to avoid polarization losses due to intrinsic spin resonances during the acceleration cycle and a robust spin imperfection correction scheme to correct residual imperfection spin resonances. The design approach involves using newly developed spin-orbit fitting tools to quickly optimize the lattice, followed by direct spin-orbit tracking to verify the performance. The base design has matured to a level which accounts for all the existing and future obstructions in the tunnel and should fit comfortably in the future eRHIC accelerator complex.

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