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## Spin Transparency Method for High Precision Experiments with Polarized Beams

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The Spin Transparency technique is discussed as an efficient, highly flexible method for control of the beam polarization. It applies from acceleration to long term maintenance and spin manipulation in real time during an experimental run of a collider or storage ring. This method relies on “transparent” collider structures where, for a particle moving on the design orbit, any initial orientation of its spin is repeated every turn at any location along the orbit. Precision control of the spin direction and the spin tune is accomplished using “spin navigators” based on weak longitudinal and transverse magnetic fields. Spin navigators can be used to compensate the effects of field errors as well as to reverse the spins multiple times during an experiment. This allows one to substantially reduce the experiment’s systematic errors and reach a new level of measurement precision. The main features of the spin transparency mode are demonstrated using the examples of a figure-8 collider, a racetrack with two identical Siberian snakes, as well as a conventional ring at an energy corresponding to an integer spin resonance. We demonstrate the feasibility of low-energy figure-8-based rings dedicated to search for Electric Dipole Moment and Dark Matter. We consider the possibility of applying the spin transparency mode at ultra-high energies.

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