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Spin coherence and betatron chromaticity of deuteron beam in NICA storage ring

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The possibility of spin control for dEDM experiment can be done by setting Wien Filters in straight section, which ensure that the particles spin retains mean direction in accordance with «Quasi-Frozen Spin» mode. However, the spin of different particles, due to their different motion in 3D space, in any case rotates with slightly different frequencies around the invariant axis, which one violates spin coherence. To ensure spin coherence, nonlinear elements, sextupoles, with a special placement on arcs must be used. Since sextupoles simultaneously affects the betatron chromaticity, we consider this complicated case.

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Footnotes

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Yes

Primary authors: Mr KOLOKOLCHIKOV, Sergey (International Union of Pure and Applied Physics); AKSENTYEV, Alexander (National Research Nuclear University); MELNIKOV, Aleksei (Russian Academy of Sciences); SENICHEV, Yury (Russian Academy of Sciences)

Presenter: Mr KOLOKOLCHIKOV, Sergey (International Union of Pure and Applied Physics)

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