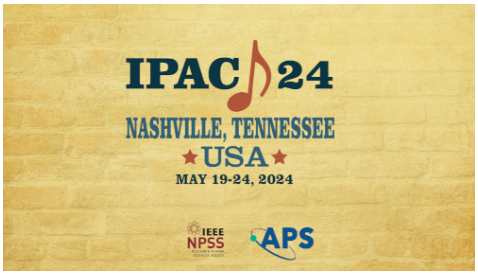

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Particle accelerator spin-transparent storage rings for beyond state-of-the-art science

Wednesday, 22 May 2024 09:50 (20 minutes)

We will describe spin-transparent storage rings that exhibit spin-coherence times of several hours and store a large number of particles and their use in novel applications. For example, these rings can be used to directly measure the electric dipole moment of the electron, relevant to CP violation and matter-antimatter asymmetry in the universe, and to search for dark energy and ultra-light dark matter*. These rings can also serve as a compelling platform for quantum computing. In this presentation, we will describe how spin-transparent rings can be used in conjunction with ion traps to enhance scalability and increase quantum coherence times of ion quantum computing.

Footnotes

- High precision fundamental physics experiments using compact spin-transparent storage rings of low energy polarized electron beams, Riad Suleiman, Vasiliy S. Morozov and Yaroslav S. Derbenev, Physics Letters B 843, 138058 (2023).

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