

eeFACT 2025 - 70th ICFA Advanced Beam Dynamics Workshop on High Luminosity Circular e⁺e⁻ Colliders



Contribution ID: 55

Type: **Invited Oral Presentation**

Advances in Free Spin Precession Method

The free spin precession (FSP) method is considered as an alternative to the well-known approach based on the use of the resonant depolarization scanning procedure (RDP). The main advantage of FSP over RDP is that the spin tune will be determined directly from the Fourier spectrum of the signal from the Compton polarimeter measuring the oscillations of the longitudinal spin component. This would eliminate much of the ambiguity in the choice of resonant frequency value from the scan data. In addition, the procedure for measuring the free precession spectrum takes only about 1-2 seconds instead of about 5-15 minutes, as in the RDP method. The paper discusses an additional possibility of measuring the phase difference of coherent spin precession measured in several polarimeters installed on the ring. The issue of obtaining the required measurement accuracy of these phases for the FCC-ee collider was investigated.

Footnotes

Funding Agency

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Yes

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Session Classification: Polarization, Energy calibration, Monochromatization

Track Classification: WG8 : Polarization, Energy calibration, Monochromatization