



Contribution ID: 2322 Contribution code: WECD2

Type: Contributed Oral Presentation

## Advancements in the development of beam dynamics software APES for CEPC

Wednesday 22 May 2024 15:20 (20 minutes)

The design and study of the Circular Electron Positron Collider (CEPC) present a significant challenge, requiring the proper modeling of various physical phenomena such as the crab-waist collision scheme with a large Piwinski angle, strong nonlinear effects, energy sawtooth, beam-beam interactions, and machine impedances. In response to this challenge, the APES software project was proposed in 2021 and received support from the IHEP Innovative Fund in 2022. This paper provides an overview of the progress made in the APES project, encompassing modeling for special cases, orbital and spin tracking with synchrotron radiation, optics and emittance calculation, particle tracking, and more. Additionally, the paper discusses future developments.

### Footnotes

### Funding Agency

### Paper preparation format

LaTeX

### Region represented

Asia

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**Session Classification:** WECD: Colliders and other Particle and Nuclear Physics Accelerators (Contributed)

**Track Classification:** MC1: Colliders and other Particle and Nuclear and Physics Accelerators:  
MC1.A04 Circular Accelerators