



Contribution ID: 2291 Contribution code: SUPC012

Type: Student Poster Presentation

Application and comparative analysis of the APES_CBI module in BEPC-II experimental results

Sunday, 19 May 2024 14:00 (4 hours)

In this paper, we delve into the application and comparative analysis of the Accelerator Physics Emulation System Cavity-Beam Interaction (APES_CBI) module within the BEPC-II (Beijing Electron-Positron Collider) experiments. We developed the APES_CBI module as an advanced time-domain solver, specifically designed to analyze RLC circuits driven by beam and generator currents and to simulate the dynamic responses and synchrotron oscillations of charged particles within the cavity.

We begin by discussing our method for solving RLC parallel circuits, followed by an explanation of the logical architecture of our program. In the second part, we detailed our simulation results, starting with the BEPC-II electron ring. By comparing these results with experimental data, we validate the reliability of our simulations, showcasing our module's ability. Additionally, we extend our simulations to the CEPC Higgs mode on-axis injection conditions and studied the transient phase response to the sudden change of beam pattern.

Footnotes

Funding Agency

Paper preparation format

LaTeX

Region represented

Asia

Primary author: FENG, Siyuan (University of Chinese Academy of Sciences)

Co-authors: WANG, Dou (Chinese Academy of Sciences); WANG, Na (University of Chinese Academy of Sciences); XIN, Tianmu (Institute of High Energy Physics); LIU, Weibin (Institute of High Energy Physics); ZHANG, Yuan (Institute of High Energy Physics); DUAN, Zhe (Institute of High Energy Physics); LI, Zhiyuan (University of Chinese Academy of Sciences)

Presenter: FENG, Siyuan (University of Chinese Academy of Sciences)

Session Classification: Student Poster Session

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