Contribution ID: **1111** Contribution code: **MOPB115** Type: **Poster Presentation**

Design of bellows in HALF vacuum system

Monday 2 June 2025 16:00 (2 hours)

The fourth generation HALF light source is a kind of storage ring light source based on diffraction limit. On the one hand, the shielded bellows in the vacuum system is used to compensate the thermal expansion and cold contraction of the vacuum chamber, and to adjust the longitudinal and transverse offset of the vacuum chamber according to the requirements of installation and collimation, on the other hand, it provides continuous shielding in the adjacent vacuum chamber to reduce the impedance of the beam pipe. The shielded bellows consists of a shielding finger, a contact finger and an inner tube, the contact finger acts on the inner tube, and the contact force comes from the elastic force formed by pressing the spring finger on the contact finger. In the structure, the high temperature area of the shielding finger is separated from the high stress area, so as to improve the durability of the bellows. The main mechanical parameters are as follows: longitudinal compression: ≥ 8mm; stretching: ≥ 8mm; lateral offset: ≥ 1mm; overall permeability ≤ 1.02 after welding, so that it can meet the requirements of vacuum system.

Footnotes

Paper preparation format

Word

Region represented

Asia

Funding Agency

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Session Classification: Monday Poster Session

Track Classification: MC2: Photon Sources and Electron Accelerators: MC2.A24 Accelerators and Storage Rings, Other