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The beam diagnostics of 300MeV proton and heavy ion synchrotron for SESRI project

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The SESRI (Space Environment Simulation and Research Infrastructure) is a large-scale space science and technology experimental research accelerator clusters, the 300MeV proton and heavy ion accelerator is the key part. It consists of an ECRIS (Electron Cyclotron Resonance Ion Source), a linac cascade injector, a compact synchrotron, and three irradiation terminals. The proton and HI with 2MeV and 5.6MeV/U can be injected, and slowly extracted from the ring with the RF-KO and ESE. The operation cycle is about 3-10s. The Scintillation Screens are used to monitor the beam profile. They are driven by motors for the different orbits. The wire scanners are used to measure the beam profile during the acceleration process, in order to obtain the beam emittance; In order to meet the requirements of large current range, the BPM system adopts a Libra adjustable gain amplifier, and uses Libra Hadron to achieve BBB and 1kHz closed orbit measurement. RF-KO provides a transverse extraction electric field. Amplitude and frequency modulation are used for the extraction signals. At the same time, a feedback system based on excitation and fast quadrupole is adopted. Through the above methods, the uniformity of beam extraction is greatly improved.

Footnotes

Funding Agency

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Yes

Primary author: ZHAO, Tiecheng (Institute of Modern Physics, Chinese Academy of Sciences)

Co-authors: MAO, Ruishi (Institute of Modern Physics, Chinese Academy of Sciences); KANG, Xincan (Institute of Modern Physics, Chinese Academy of Sciences); Mr TANG, kai (Institute of Modern physics, Chinese Academy of Science); Mr ZHOU, kai (Institute of Modern physics, Chinese Academy of Science); Ms LI, min (Institute of Modern physics, Chinese Academy of Science); Mr LI, weilong (Institute of Modern physics, Chinese Academy of Science); Mr FENG, yongchun (Institute of Modern physics, Chinese Academy of Science); Mr CHEN, yucong (Institute of Modern physics, Chinese Academy of Science); Mr XU, zhiguo (Institute of Modern physics, Chinese Academy of Science)

Presenter: ZHAO, Tiecheng (Institute of Modern Physics, Chinese Academy of Sciences)

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