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The study of the beam characteristics of the SKIF linear accelerator

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The fourth-generation synchrotron light source Siberian Ring Photon Source (SKIF), located in Novosibirsk, Russia, underwent the tuning of its linear accelerator segment successfully. By deploying a designed beam diagnostic system, crucial parameters of the beam including beam transverse and longitudinal dimensions, energy spread, emittance, and current, were accurately measured. To achieve these measurements, the system was equipped with several fluorescent screens, Cherenkov radiation detectors, a dipole energy spectrometer, and a Faraday cup. This paper elaborates on the design, mode of operation, and practical applications of these diagnostic devices during the accelerator's tuning process. Further, potential areas of optimization for these diagnostic methods are explored to provide feasible directions for enhancing the performance of the linear accelerator. These precise diagnostic tools have been pivotal in the successful tuning of the SKIF linear accelerator. The results thus gathered will form a significant reference point for the development and refinement of similar accelerators in the future.

Footnotes

Funding Agency

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Yes

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