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The vacuum system design of the RF cavity section in the booster of the Iranian Light Source Facility

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The Iranian Light Source Facility (ILSF) Booster, which is currently in the design phase, has a circumference of 504 meters and accelerates electron bunches from 150 MeV to 3 GeV. The RF cavity section of the Booster is a key area, where maintaining ultra-high vacuum (UHV) conditions is essential to ensure stable beam acceleration and minimize beam-gas interactions. This work presents the integrated layout of the vacuum system for the RF cavity section of the Iranian Light Source Facility Booster. The conceptual design of the RF cavity section for the ILSF Booster, developed to meet these requirements, consists of three 100 MHz main cavities. The pressure profile has been calculated using Monte Carlo simulations, and the results fall within the accepted operational limits of the machine. These results suggest that three diode ion pumps, each with a pumping speed of 300 l/s, will be required to attain the desired pressure in the ultra-high vacuum regime.

Footnotes

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