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Design and construction of a traveling wave electron linear accelerator at Institute for Research in Fundamental Sciences (IPM)

Sh Sanaye Hajari¹, M Shirshekan¹, H Shaker¹, F Ghasemi², S Ahmadian Namin¹, M Ansari³, M Bahrami¹, H Behnamian¹, S Haghtalab¹, M Khalvati¹, E Darvish¹, H Delsim Hashemi⁴, H Salamati⁵, M Salehi², F Abbasi Davani⁶, S Kasaie¹, S nazemi⁶, S Varnaseri⁷, M Yarmohammadi Satri², and M Lamehi Rashti¹

1. School of Particles and Accelerator, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran
2. Physics and Accelerator Research School, Nuclear Science and Technology Research School (NSTRI), Tehran, Iran
3. Radiation Application Research School, Nuclear Science and Technology Research School (NSTRI)
4. Deutsches Elektronen-Synchrotron (DESY), Machine physics, Hamburg, Germany
5. Physics Faculty, Isfahan University of Technology, Isfahan, Iran
6. Nuclear engineering, Shahid Beheshti university, Tehran, Iran
7. Ess-Bilbao, Spain

E-mail: mlamehi@aeoi.org.ir

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Abstract

In this paper, the design and construction process of a traveling wave electron linear accelerator is presented briefly. The machine consists of an electron gun followed by a prebuncher, a traveling wave buncher, an accelerating tube and the diagnostics instruments. Solenoid magnets provide the beam focusing. A klystron has been used as the RF power source. The linac components are controlled and monitored by a comprehensive control system. All the sub systems of this accelerator are designed and developed based on the domestic technology. The output beam has a maximum energy of 4.5 MeV. The beam parameters like energy, intensity, transverse size and emittance are measurable and tunable. The IPM Linac is a unique tool for experimental R&D in accelerator and beam physics in Iran.

Keywords: linear accelerator, cavity, electron gun, radio frequency, accelerator control, beam characteristic, shielding

For full article, refer to the Persian section