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

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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