Design and construction of cavity frequency measurement and tuning systems of traveling wave electron linear accelerator

S Ahmadiannamin¹, F Ghasemi², F Abbasi Davani³, M Lamehi Rachti¹, M Shirshekan¹ and M Bahrami¹

1. School of Particles and Accelerators, Institute for Research in Fundamental Sciences
2. Nuclear Science and Technology Research Institute, Atomic Energy Organization of Iran (AEOI)
3. Radiation Application Department, Nuclear Engineering Faculty, Shahid Beheshti University

Abstract

The main purpose for designing and constructing electroradio frequency linear accelerators is to reach better beam quality with higher power and energy by lower RF power consumption. The main step for this purpose is doing research and development in the area of designing, constructing, measuring and tuning of accelerator RF cavities. Institute for Research in Fundamental Sciences (IPM) linear accelerator project is the first Iranian project for construction of electrolinear accelerator. In this paper, a brief introduction to construction procedure has been given. Then, the measurement and tuning of a disk-loaded periodic structure before and after tuning was reported. In addition, the detailed design and measurement setup for electric field measurement by perturbation method was investigated.

Keywords: disk-loaded structure, constant impedance, accelerator cavity, bead pull setup, Slater perturbation method, tuning

For full article, refer to the Persian section