

Evaluation of a new method of RF power coupling to acceleration cavity of charged particles accelerators

A Mohammad Poursaleh^{1,2}, I Jabbari¹ and H Khalafi²

1. Department of Nuclear Engineering, Faculty of Advanced Sciences and Technologies, University of Isfahan, Isfahan, Iran
2. AEOI, Nuclear Science and Technologies Research Institute , Central Iran Research Complex, Yazd, Iran

Abstract

In this paper, the feasibility study of a new method of RF power coupling to acceleration cavity of charged particles accelerator will be evaluated. In this method a slit is created around the accelerator cavity, and RF power amplifier modules is connected directly to the acceleration cavity. In fact, in this design, the cavity in addition to acting as an acceleration cavity, acts as a RF power combiner. The benefits of this method are avoiding the use of RF vacuum tubes, transmission lines, high power combiner and coupler. In this research, cylindrical and coaxial cavities were studied, and a small sample coaxial cavity is build by this method. The results of the resarch showed that compact, economical and safe RF accelerators can be achieved by the proposed method.

Keywords: charged particles accelerator, RF power coupling, acceleration cavity, solid state amplifier

For full article, refer to the Persian section