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## Design of cavities of a standing wave accelerating tube for a 6 MeV electron linear accelerator

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### Abstract

Side-coupled standing wave tubes in  $\pi/2$  mode are widely used in the low-energy electron linear accelerator, due to high accelerating gradient and low sensitivity to construction tolerances. The use of various simulation software for designing these kinds of tubes is very common nowadays. In this paper, SUPERFISH code and COMSOL are used for designing the accelerating and coupling cavities for a 6 MeV electron linear accelerator. Finite difference method in SUPERFISH code and Finite element method in COMSOL are used to solve the equations. Besides, dimension of accelerating and coupling cavities and also coupling iris dimension are optimized to achieve resonance frequency of 2.9985 MHz and coupling constant of 0.0112. Considering the results of this study and designing of the RF energy injection port subsequently, the construction of 6 MeV electron tube will be provided.

**Keywords:** linear accelerator, accelerating tube, COMSOL, SUPERFISH code

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