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Higher order mode assessment in a single mode accelerating cavity

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With the upgrade from PETRA III to PETRA IV the requirements concerning the beam parameters increase. Thus, a special focus is placed on the suppression of higher order modes (HOMs) in the accelerating systems. An Investigation of the already presented single mode structure showed the emergence of certain higher order modes. These cavity eigenmodes are now examined by evaluating and assessing their degrading influence on the particle beam by calculating kick and loss factors. Subsequently, the cavity geometry is changed to attenuate the HOMs'influences or even supress them entirely. In this paper the optimization process using numerical simulations together with the achieved results and cavity structure are presented.

Footnotes

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