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Analysis of the Panofsky-Wenzel Theorem in pillbox cavities with a beam pipe

Monday 26 August 2024 16:00 (2 hours)

In this paper, we derive the multipolar form of the change in transverse and longitudinal momenta of an ultrarelativistic charged particle that traverses a harmonic TM_{mn0} mode in a pillbox cavity with a beam pipe. The relevant equations are first formalised before presenting results from the numerical integration of RF cavity field maps. In particular, we show that the radial dependence of the change in transverse and longitudinal momenta through a TM_{mn0} mode has polynomial, and not Bessel, dependence.

Footnotes

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Primary author: WROE, Laurence (European Organization for Nuclear Research)

Co-authors: LATINA, Andrea (European Organization for Nuclear Research); SOUTHERBY, Matthew (Cockcroft Institute); APSIMON, Robert (Cockcroft Institute); STAPNES, Steinar (European Organization for Nuclear Research); WUENSCH, Walter (European Organization for Nuclear Research)

Presenter: LATINA, Andrea (European Organization for Nuclear Research)

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