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Accurate offline calibration and simulation analysis of various types of BPM position sensitivity

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Beam Position Monitors (BPMs) are the most commonly used non-destructive diagnostics for almost all linear accelerators, cyclotrons, and synchrotrons. It is very important for BPM to provide accurate beam position for closed-orbit correction, and etc. Meanwhile, it is necessary to accurately offline calibrate the BPM position sensitivity and evaluate whether the result is correct or not. In this paper, a method based on the principle of microwave multi-port network in the field of electromagnetic field is proposed to efficiently simulate the BPM position sensitivity; a large number of various BPMs (capacitive, linear-cut and stripline type) for HIAF and PREF projects were calibrated; comparing the calibration and simulated position coefficients, combined with the three-dimensional field distribution analysis, an in-depth and systematic study was carried out on various types of BPM calibration, during which some key points that determine whether the calibration results were accurate after the BPM was launched were found.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

Author: HE, Peilin (Institute of Modern Physics, Chinese Academy of Sciences)

Co-authors: WU, Junxia (Institute of Modern Physics); Mr XIE, Hong Ming (Institute of Modern Physics); LI, Lili (Institute of Modern Physics); Mr YIN, Jia (Institute of Modern Physics); DU, Ze (Institute of Modern Physics); LI, ZhiXue (Institute of Modern Physics); TIAN, Ruixia (Institute of Modern Physics); YANG, Jiancheng (Institute of Modern Physics); Prof. XIA, Jiawen (Institute of Modern Physics)

Presenter: HE, Peilin (Institute of Modern Physics, Chinese Academy of Sciences)

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