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New method of obtaining longitudinal phase space information in LINAC

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We tried to obtain longitudinal phase space tomography in LINAC by using the information of energy spread due to chicane magnets. The motion in the bending plane is governed by energy spread and betatron motion. Thus, at first, we used transverse phase space tomography to obtain betatron motion information and then calculated the energy spread. The longitudinal phase space is rotated by changing the RF phase and the energy spread data is used as the projections. We used backprojection method to obtain the initial phase space in longitudinal direction from the projection in momentum space. We applied this method in KEK-STF beamline which consists of 1.3 GHz L-band normal conducting RF gun, two solenoid coils for adjusting the magnetic field, a chicane region with four dipole magnets, two cryomodules, and some quadrupoles and skew quadrupoles. Here we report the results of the study.

Footnotes

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