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Measurement of transverse profile in novel accelerators

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The measurement of transverse profiles is key to determining central parameters of the electron beam. Additionally, transverse profile monitors are used in conjunction with an RF deflecting structure to measure bunch length and slice emittance. A transverse deflecting structure and a dipole can be used to measure the longitudinal phase space. This is of particular interest behind an undulator in a free electron laser, where information on the FEL process and the resulting radiation can be deduced from the measurement of the electron beam. Novel acceleration techniques impose specific challenges on the instrumentation, but ultimately, the methods are the same as in radio frequency accelerators.

I will therefore present recent advances in profile measurements in SwissFEL and the Swiss Light Source, including scintillating screens, wire scanners, and imaging and interference techniques for synchrotron radiation from dipole magnets.

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