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Design of a non-invasive bunch length monitor using coherent synchrotron radiation simulations

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Synchrotron radiation (SR) is a phenomena found in most accelerator facilities. Whilst many look to reduce the amount of SR produced to minimize beam losses, its existence allows for several types of novel non-invasive beam instrumentation. The aim of this study is to use SR in the development of a non-invasive, high resolution, longitudinal bunch length monitor. The monitor will be capable of sub 100 fs bunch measurements, which are becoming more common in novel acceleration and free electron laser facilities. This contribution details the simulation work carried out in Synchrotron Radiation Workshop (SRW), which allows for complex studies into the production and features of coherent synchrotron radiation (CSR). The design of the monitor has also been discussed, alongside simulations of the planned optical setup performed in Zemax OpticStudio (ZOS).

Footnotes

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