

Development of fast kicker prototype for SLS 2.0 advanced injection schemes

Tuesday 25 April 2023 16:00 (30 minutes)

Swiss Light Source plans an upgrade to turn its existing Storage Ring (SR) into a modern diffraction limited light source (SLS 2.0). A 4-kicker bump scheme with new thick and thin septum will ensure the conventional injection in the smaller aperture of the new SR. To reduce further the perturbation of the stored beam during top-up, two new injection schemes are developed: “Fast” and “Super-fast”. The “Fast” injection should be able to ensure single-bunch off-axis injection affecting only 10 to 20 SR bunches (SR bunch spacing is 2 ns) in so called Aperture Sharing (AS) mode. The “Super-fast” one should utilize single-bunch off-axis injection affecting only one SR bunch (AS mode) or, in the future, on-axis injection between two SR bunches. To realize these injection schemes an extremely fast kicker system is required to provide deflection duration of about 30 ns for the “Fast” scheme and less than 2 ns for the “Super-fast” one. For practical reasons we decided to design a stripline kicker capable of 2 ns second deflection duration, given that if this is achieved, the same kicker can produce longer deflection durations when excited with longer electrical pulses. To prove the concept a prototype stripline kicker is being designed. We will present the status of its development and will discuss some of the critical aspects of such design.

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Session Classification: Afternoon session