

Design of a new Multipole Injection Kicker (MIK)

Tuesday 25 April 2023 14:30 (30 minutes)

Top-Up injection in the new SOLEIL II storage ring is planned to use an off-axis on-momentum betatron scheme. The final kick on the injected beam into the small dynamic aperture is given by a non linear kicker or MIK. To ensure the quality and transparency of the injection, the peak magnetic field generated by the MIK must be located at 3.5 mm from the stored beam axis while the zero-field region around the stored beam should be of octupolar type. The MAXIV type MIK developed by SOLEIL in the previous years could not be reused as placing the peak field at 3.5 mm by shrinking the 8-conductor design would lead to a roughly 1 mm aperture for the beams, impracticable for use in a storage ring. Therefore, the SOLEIL pulsed magnet team had to design a new MIK topology from scratch to achieve the required magnetic field distribution, while providing a sufficient aperture for the beams. The presentation focuses on the challenges that were met in defining new suitable topologies, pulsed operation in vacuum, mechanical & thermal design of the magnet as well as the titanium coating effects on the pulsed magnetic field distribution.

Presenter: ALEXANDRE, Patrick (Soleil)

Session Classification: Afternoon session