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Optimization of beam impedance mitigation measured for HV reliability in an SPS injection kicker

Monday 24 April 2023 17:00 (30 minutes)

The SPS injection kicker magnets (MKP) were developed in the 1970's, before beam induced power deposition in the ferrite yoke was considered an issue. These magnets are very lossy from a beam impedance perspective which limits SPS operation, e.g. with the higher intensity beams needed for HL-LHC. An upgraded design, with serigraphy applied to alumina U-chambers, has been developed to significantly reduce the broadband beam coupling impedance and thus the beam induced heating. During high voltage pulse testing there were electrical discharges associated with the serigraphy. We discuss the solutions implemented to mitigate the discharges while maintaining an adequately low beam-coupling impedance. The upgraded magnet has been installed in the SPS: the initial results of operation with beam are presented.

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