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## Initial operational experience of an LHC injection kicker magnet upgraded for HL-LHC

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The intensity of the HL-LHC beam will be twice that of LHC. Hence, an upgrade of the LHC injection kickers (MKIs) is necessary for HL-LHC to avoid excessive beam induced heating of the MKIs. In addition, any newly installed MKI magnet would limit HL-LHC operation for a few hundred hours due to dynamic vacuum activity. Extensive studies have been carried out to identify solutions to address these problems and they have been implemented in an upgraded LHC injection kicker magnet (MKI Cool): the MKI Cool was installed in the LHC during the 2022-23 Year End Technical Stop. Magnet heating has been reduced by redistributing a significant portion of the beam induced power deposition from the ferrite yoke to a ferrite loaded RF Damper, which is not at pulsed high voltage, and by water cooling of the damper. Furthermore, a surface coating, to mitigate dynamic vacuum activity, has been applied. This paper discusses the upgrades, presents results from the initial operational experience, and compares the predicted and 'measured' beam induced power deposition.

### Footnotes

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Europe

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