

Evaluation of the Beam Coupling Impedance of New Beam Screen Designs for the LHC Injection Kicker Magnets

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Abstract

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The LHC injection kicker magnets (MKIs) have experienced a significant degree of beam induced heating since the beginning of the 2011 due to the increasing intensity stored in the LHC, for long periods of time, and the relatively large broadband impedance of the installed kicker magnets. In this paper we show the sources of impedance in the MKIs, especially the effect that the beam screen dimensions have on the impedance. We show how these alter the power loss, and present an improved beam screen design that improves shielding on the magnet, whilst further improving electrical breakdown.

REFERENCES

- [1] "Analysis of Measured Ferrite Heating of the LHC Injection Kickers and Proposals for Future Reduction of Temperature", M.J. Barnes, L. Ducimetire, N. Garrel, B. Goddard, W. Weterings, these proceedings.
- [2] "An Improved Beam Screen for the LHC Injection Kickers", M.J. Barnes, F. Caspers, L. Ducimetire, N. Garrel, T. Kroyer, PAC'07, Albuquerque, USA, 2007.
- [3] <http://www.cst.com>.
- [4] "Coaxial Wire Measurements of Ferrite Kicker Magnets", H. Day, M. J. Barnes, F. Caspers, E. Mtral, B. Salvant, C. Zanini, R.M. Jones, IPAC'11, San Sebastian, 2011, MOPS078.
- [5] *Beam-Induced Heating/Bunch Length/RF and Lessons for 2012*, E. Metral et al, LHC Performance Workshop, Chamonix 2012.

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