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FCC kicker magnet design, impedance and heating aspects

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A fast, highly reliable, injection kicker system is required for FCC injection: the system must not limit accelerator performance. Important considerations in the design of such a system are machine protection constraints, collider filling factor and hence rise and fall times of the kicker magnet field. Fast rise time kicker magnets are generally ferrite loaded transmission line type magnets with a rectangular shaped aperture. The beam coupling impedance of the kicker magnets is important: if the ferrite temperature exceeds the Curie point this impacts the ability to inject beam and hence the availability of the machine. This FCC kicker magnet design is presented together with impedance and heating aspects.

Primary author: BARNES, Mike (CERN)

Presenter: BARNES, Mike (CERN)

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