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Combined-function optics for the lattice of the CERN hadron-hadron Future Circular Collider ring

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Magnetic fields in the 12-16 T range are needed to bend the beams in future hadron colliders, such as the CERN FCC-hh. For these magnets, made with Nb3Sn superconducting cable, a small reduction of the field brings a non-negligible reduction of cost and complexity. Increasing the dipole filling factor is hence a priority to provide higher energies for the same magnetic fields - or the same energies for lower magnetic fields. To this aim, the use of combined-function magnets is proposed to design the ring lattice in place of the standard separate-function solution. The properties of the combined-function solution and of the magnets that would be needed for the FCC-hh are presented and discussed in detail in this paper.

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Footnotes

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Yes

Primary authors: TODESCO, Ezio (European Organization for Nuclear Research); GIOVANNONZI, Massimo (European Organization for Nuclear Research)

Presenter: GIOVANNONZI, Massimo (European Organization for Nuclear Research)

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