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Twin aperture bending magnets and quadrupoles for FCC-ee

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We report the magnetic design of twin resistive magnets, with a field configuration applicable to large lepton colliders, like FCC-ee. The bending magnets are based on an I-layout, with a common iron yoke powered by two busbars; both pure dipoles and combined function units with an embedded gradient are considered. The quadrupoles present a peculiar geometry, with eight poles but only two coils; their inherent asymmetry is compensated at the pole tip level to provide a good field homogeneity in the bore. For these magnets, the advantage of using a twin design brings – besides a reduction in the number of components and units – a significant power saving, of the order of 50% with respect to a traditional approach – which makes them attractive for use in large machines. The paper also provides an update on the construction of short models, with possibly first results of magnetic measurements.

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