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## Design, Manufacture and Measurement of three Permanent Magnet Dipoles for FASER Experiment

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FASER, the ForwArd Search ExpeRiment, is designed to search for new, yet undiscovered, light and weakly-interacting particles and study the interactions of high-energy neutrinos. Three dipoles are required to achieve sufficient separation of pairs of oppositely charged, high-energy Standard Model particles originating from decays of new physics particles. The first magnet is 1.5-m-long and surrounds a decay volume in the upstream part of the detector, the following two magnets are 1-m-long each.

The dipoles are of Halbach array type, and have an aperture of 200 mm in diameter with a minimum required magnetic field at the centre of 0.55 T. Due to tight space constraints, a design based on permanent magnet technology was proposed. This paper describes the design, manufacture, assembly, magnetic measurement and installation in the LHC of these large dipoles.

**Primary authors:** THONET, Pierre Alexandre (CERN); DUNKEL, Olaf (CERN); Mr LIEBSCH, Melvin (TE-M-SC-MM); Mr PENTELLA, Mariano (Department of Applied Science and Technology, Polytechnic of Turin, Turin, Italy); PETRONE, Carlo (CERN)

**Presenter:** THONET, Pierre Alexandre (CERN)

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