



Contribution ID: 1242

Type: **Poster Presentation of 1h45m**

## Sector DC Dipoles Design for the Beam Test Facility Upgrade

*Tuesday 29 August 2017 13:15 (1h 45m)*

The Beam Test Facility (BTF) is part of the DAΦNE accelerators system, of INFN Frascati National Laboratory (LNF). It is a transfer-line optimized for selection, attenuation and manipulation of electrons and positrons extracted from the DAΦNE LINAC. An upgrade of the line is scheduled by the end of 2018 in order to reach a beam energy of 920 MeV (with respect to the actual 750 MeV) and a new branch of the actual transfer line, in order to have two different beam lines into two separate test apparatus.

The layout of the new transfer line foresees seven new quadrupoles and a beam deflection of 135 degrees achieved through a 15 degrees fast ramped dipole and three DC sector dipoles particularly two with 45 degrees and one 35 degrees bending angle.

The design of the magnets has been completely performed at INFN, including electromagnetic, mechanical, thermal and hydraulic aspects. Electromechanical Enterprise partner were involved in the design phase in order to optimise the manufacturing process. This effort leads to a complete set of detailed CAD drawings that can be directly used from industrial partners to build the magnets. The goal is to boost the manufacturing of prototypes and small series from Small and Medium Enterprises. Magnetic measurements will be later performed at our Institute.

This paper is focused on the realization of the two 45 degrees H-shape dipoles and on the 35 degrees C-shape dipole. All the three dipoles have a full iron yoke and they are characterize by a high flux density that reach the maximum value of 1.7 T in a pole gap of 35mm. This requirement is due to the combination of beam energy and geometrical constraints of the hall that will host the line that limits the allowable curvature radius at 1,8 m.

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**Session Classification:** Tue-Af-Po2.02

**Track Classification:** A2 - Resistive Accelerator Magnets