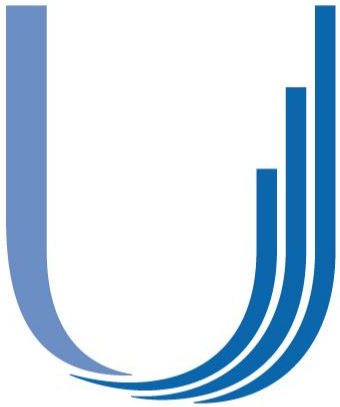
Vertical BGI magnet



LHC Injectors Upgrade

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Requirements for the vertical BGI magnet

- Magnet performances:

Magnet gap around the detector: 204 mm

Magnetic field in the detector gap: 0.2 T

Field homogeneity in the detector gap: 10^{-3}

The good filed region is defined as:

Beam axis: 28 mm

Transverse axis: 146 mm

Vertical axis: 84 mm

Integrated field along the beam axis: 0 Tm

Return yoke gap: 160 mm

Total length: 805 mm (same as for the horizontal version)

- Magnet design:

As seen with the horizontal version of the BGI the goal is to integrate the 3 bump magnet in the same straight section. It is also needed to have independent powering of the main and trim coils to tune the integrated field.

Due to the detector gap increase, the field homogeneity in the detector region is directly affected.

The first step is to design the magnet to reach the magnetic field of 0.2 T, then to optimize the poles to converge to the required field homogeneity.