11. MT STUDENT RETREAT
GSI Darmstadt 05.11.25

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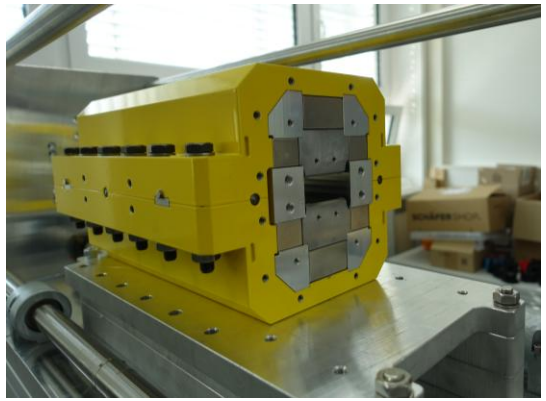
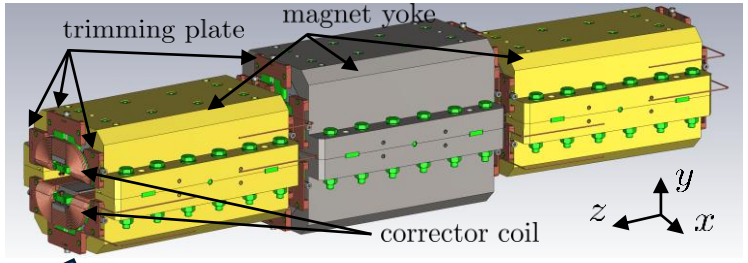
MATTER AND TECHNOLOGIES

HZB BESSY II Light Source

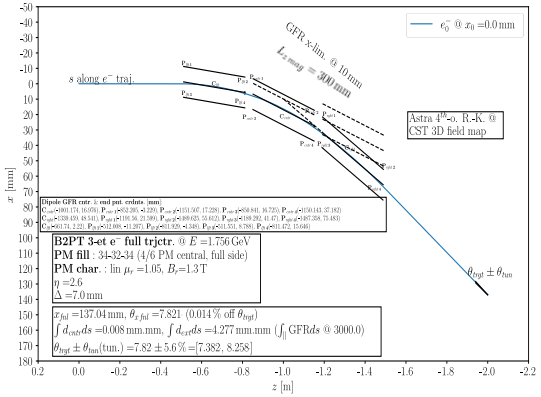
BESSYII → BESSYII+ → BESSYIII

Sustainable Permanent-Magnet (PM)-based Accelerator Magnets for BESSYII+ and BESSYIII (greenfield, ~2035) @ HZB Adlershof





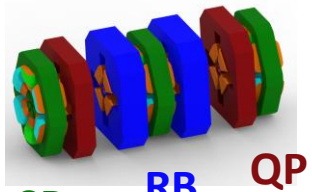
B2PT Dipole Triplet @ BESSYII+:
Installation in 2026 in BESSYII(+).

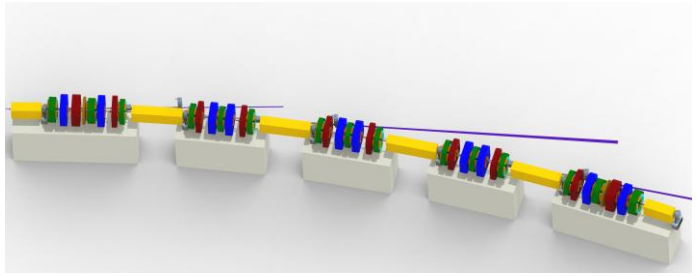


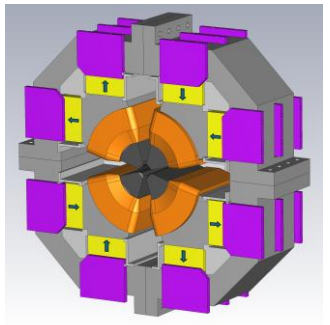
- x3 300-mm PM dipoles ~(0.8 T – 1 T – 0.8 T)
- NdFeB PM blocks with B_r = 1.3 T
- First PM Hybrid Dipole magnet @ BESSY II+ to stabilize the beam injection in the storage ring and reduce power consumption by ~30kW.
- Trimming plates and correctors for field tuning.

BESSYIII

- Design phase of PM based magnets for the storage ring:
  - 96 hom. DPs (64 x 0.7T, 32 x 0.8T, optional: 16x 1.5T, 16 x 2.3T).
  - 288 QPs (50-80 T/m).
  - 160 RBs (QP=80T/m + DP=0.25T).
- 240 resistive SPs.







- PM blocks
- Tuning plates
- Corrector Coil
- Yoke steel
- CoFe PoleTip

Collab. Mag. project @ RF2.0:

- Option as Rev. Bend @ BESSYIII.
- Hybrid PM high-grad. quad.
- Motorized tuning plates (patent).
- Fast el. Tuners.
- Nearly 0 power (v.-a-v. el. Mag.).

RF2.0 RESEARCH FACILITY TOWARDS A MORE ENERGY-EFFICIENT AND SUSTAINABLE PATH

Funded by the European Union

MAXIV

DESY.

ALBA

ELYTT ENERGY