

Experimentelle Methoden der Teilchenphysik

Sommersemester 2011/2012

Albert-Ludwigs-Universität Freiburg



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Kapitel 5: Impulsmessung

<http://terascale.physik.uni-freiburg.de/lehre/Sommersemester%202012>

Magnetsysteme

Curvature of particle trajectory in magnetic field B gives momentum component transverse to magnetic field:

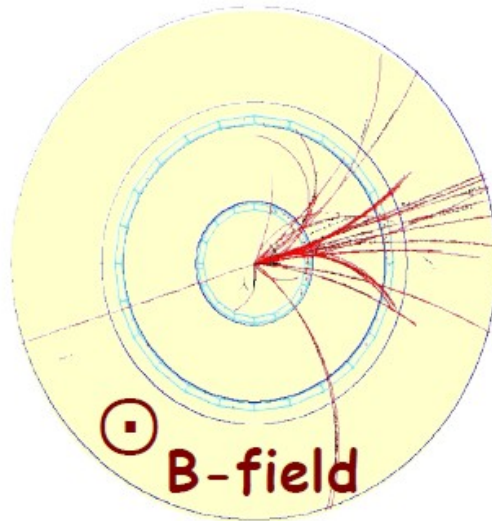
$$p_T = q \cdot B \cdot \rho$$

$$p_T [\text{GeV}] = 0.3 \cdot B [\text{T}] \cdot \rho [\text{m}]$$

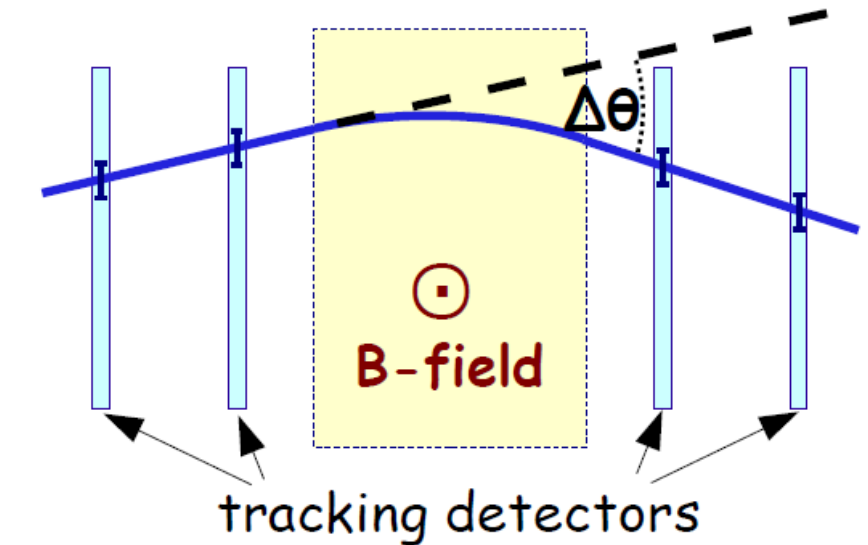
Direction of curvature defines charge sign.

Typical layouts:

Solenoid: field \parallel beam axis

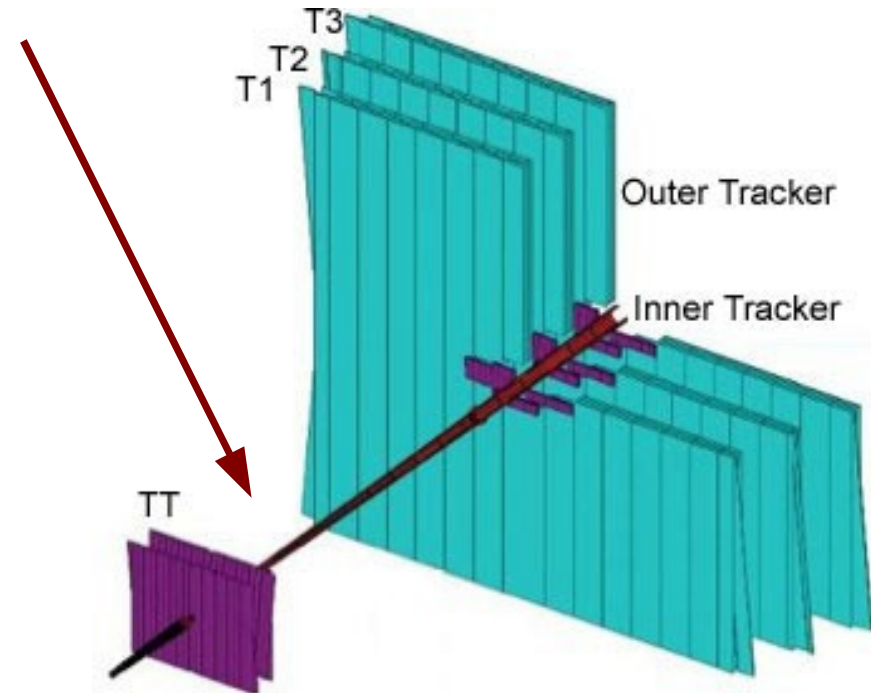
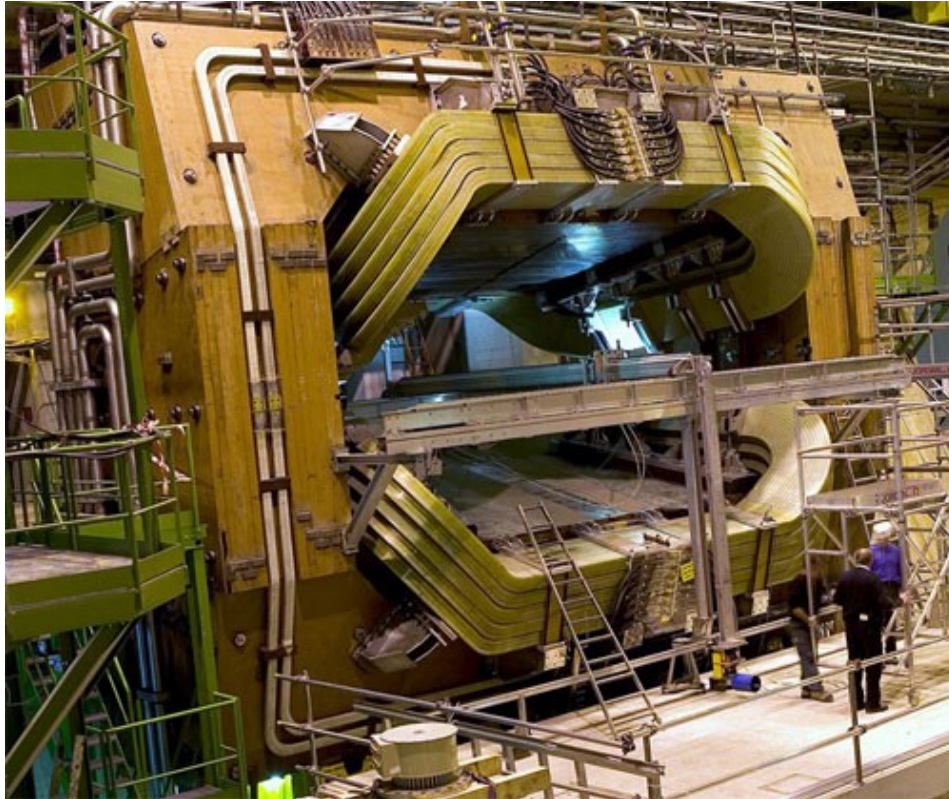


Dipole: field perp. beam axis

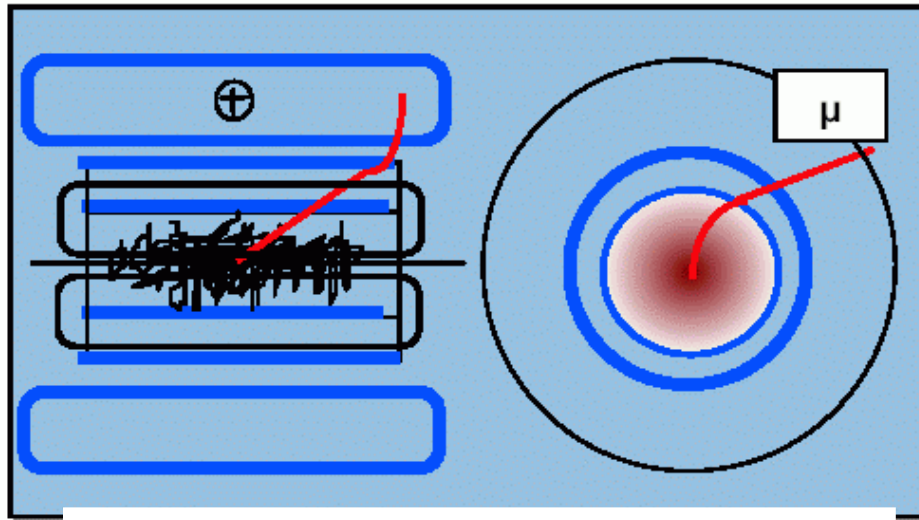
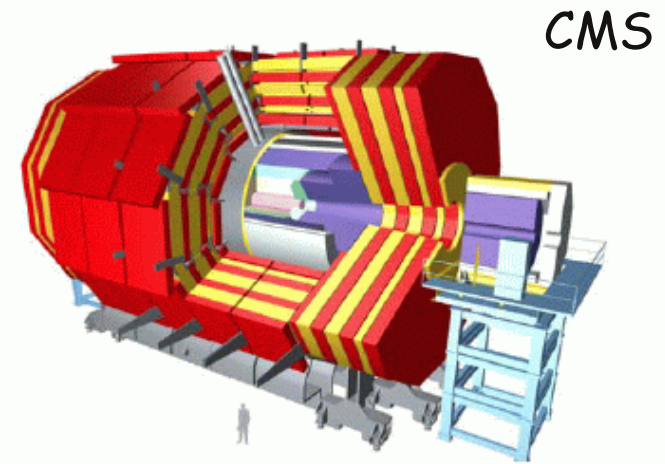
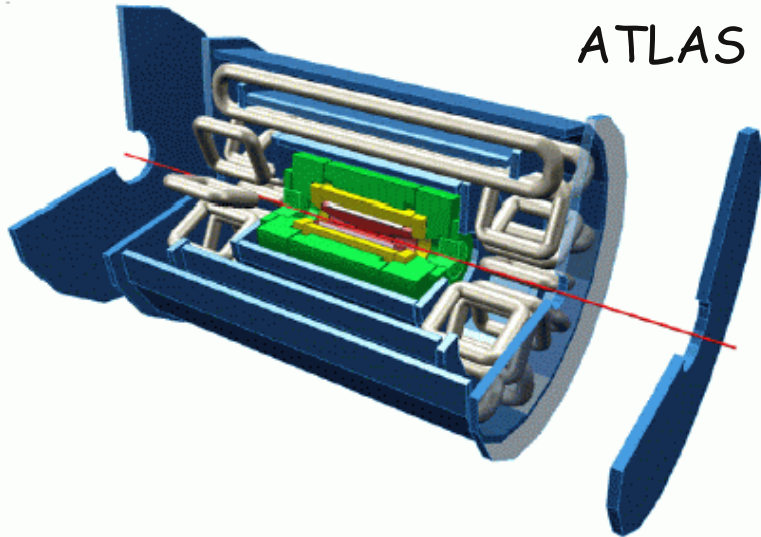


Magnetsysteme

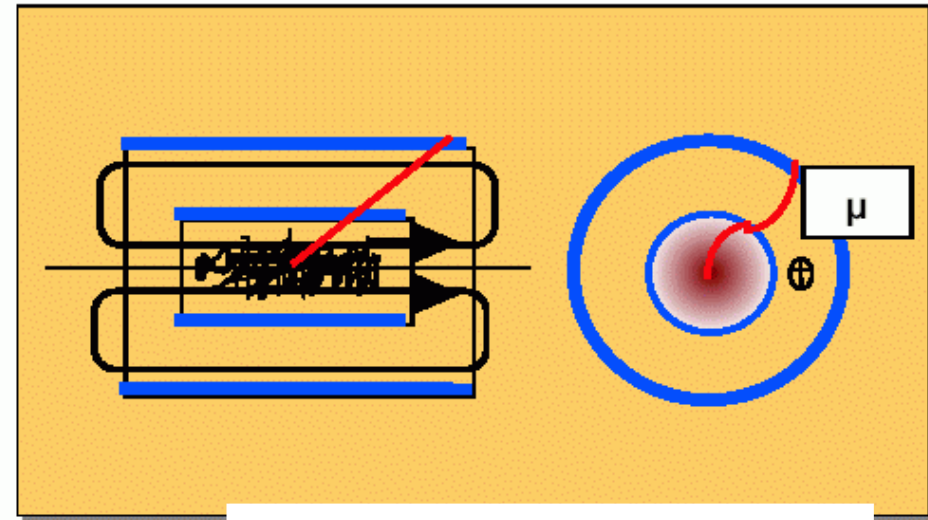
LHCb



Magnetsysteme



Small solenoid (2T) for the Tracker
Toroids for the muon system



Big solenoid (4T)
Calorimeters inside solenoid