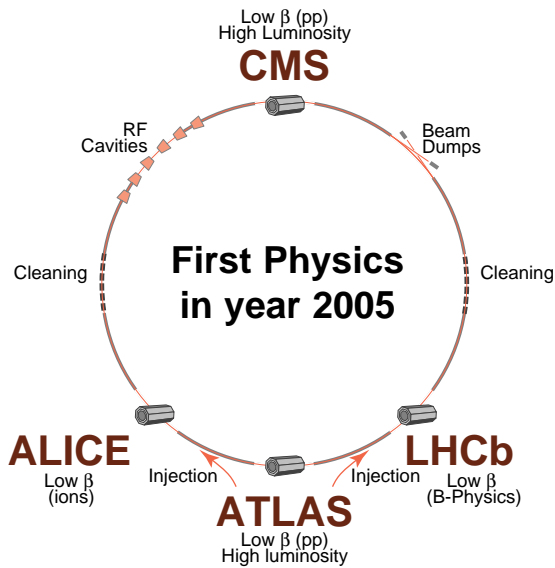




The LHC Machine

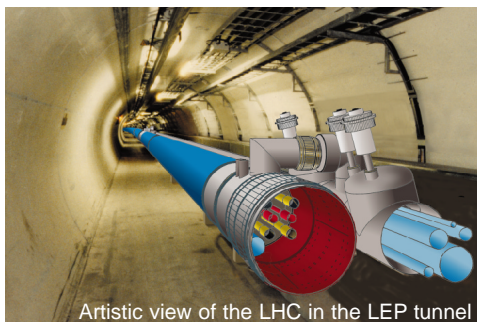
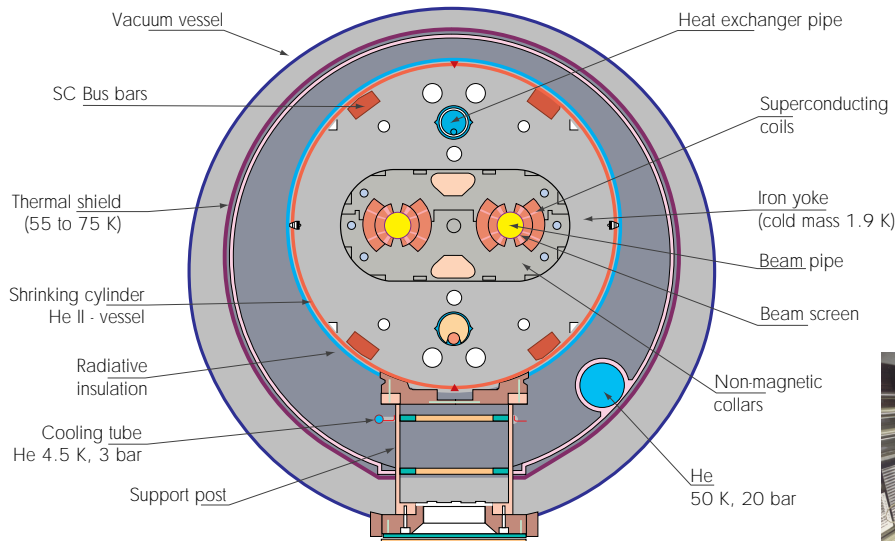


The LHC will enable the study of proton-proton, ion-ion and, later on, electron-proton collisions. The existing chain of injectors (booster, PS, SPS) will provide the necessary particles.

LHC Performance Parameters

| | | |
|---------------------------------|----------------------------------|------------------|
| Energy | TeV | 7.0 |
| Dipole field | T | 8.3 |
| Coil aperture | mm | 56 |
| Distance between apertures | mm | 194 |
| Luminosity | cm ⁻² s ⁻¹ | 10 ³⁴ |
| Beam-beam parameter | | 0.0034 |
| Injection energy | GeV | 450 |
| Circulating current / beam | mA | 540 |
| Bunch spacing | ns | 25 |
| Bunches per beam | | 2835 |
| Particles per bunch | | 10 ¹¹ |
| Stored beam energy | MJ | 334 |
| Normalized transverse emittance | μm.rad | 3.75 |
| r.m.s. bunch length | m | 0.075 |
| β-values at I.P. in collision | m | 0.5 |
| Full crossing angle | μrad | 200 |
| Beam lifetime | h | 22 |
| Luminosity lifetime | h | 10 |
| Energy loss per turn | keV | 6.7 |
| Critical photon energy | eV | 44.1 |
| Total radiated power per beam | kW | 3.6 |

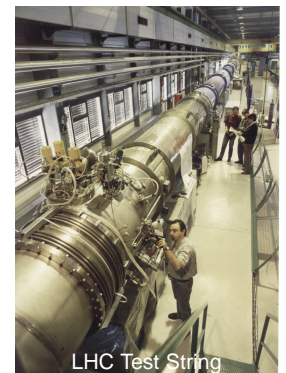
Dipole Cross Section



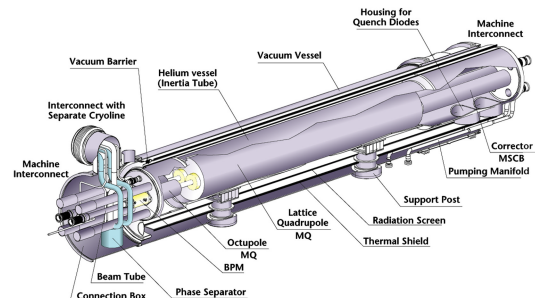
Artistic view of the LHC in the LEP tunnel

The LHC superconducting magnets will generate the highest magnetic fields ever reached on this scale. The dipoles and quadrupoles will be interconnected so as to form a continuous cryogenic "pipe"

installed in the 27 km-long LEP tunnel with its separate cryoline. The superconducting RF accelerating cavities, along with the beam cleaning and beam dumps systems will complete the machine.



LHC Test String



Short Straight Section of the LHC Machine

Large Hadron Collider

