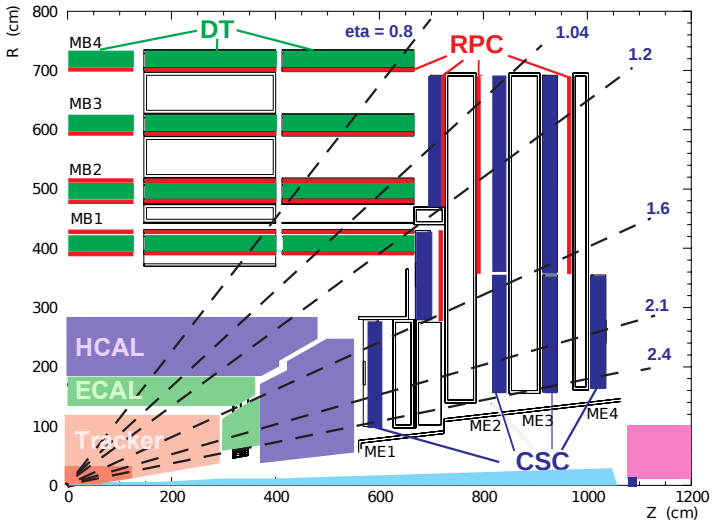

Figure 1. Layout of one quadrant of CMS. The four DT stations in the barrel (MB1-MB4, green), the four CSC stations in the endcap (ME1-ME4, blue), and the RPC stations (red) are shown.

in the scenario of an LHC luminosity going up to 10^{34-35} cm$^{-2} \cdot$ s^{-1}. There is ongoing work in identifying suitable technologies to instrument the high η region up to 2.4 matching the CSC system. The RPCs are used at trigger level and also in the standard offline muon reconstruction.

In the barrel region the muon chambers are organised in four coaxial stations, interleaved with iron return yokes. A station is an assembly of chambers around a fixed value of r in the barrel (or z in the endcap). Each of the two inner stations (MB1, MB2) contains layers of DTs sandwiched between two layers of RPCs, whereas each of the two outer stations (MB3, MB4) consists of one layer of RPCs and layers of DTs. Along z, these barrel stations are grouped into five wheels, which are in turn divided into twelve ϕ sectors. Similarly in the r direction in the endcaps there are rings of CSCs, increasing with the radial distance from the beam line. Each endcap ring is composed of 36 chambers covering the full azimuthal range. The endcap region is composed of three iron disks holding a total of three RPC planes and four CSC planes on each side (plus/minus) along z.

3. RPC Hits in Muon Reconstruction

Muon tracking in CMS can be performed with the silicon tracker, and with either three or four stations of muon chambers installed outside the solenoid, sandwiched between steel layers serving both as hadron absorbers and as a return yoke for the magnetic field [4].

Three types of muon-track reconstruction were designed for muons originating from the LHC proton-proton collisions. Muon tracks can be reconstructed by using hits in the muon detectors alone (standalone muons). Alternatively, the reconstruction can combine hits in the muons detectors with those in the central tracker (global muons). The muon system can also be used purely to tag extrapolated tracks from the central tracker; such tracks qualify as tracker muons if at least one muon segment (i.e. a short track stub made of DT or CSC hits) matches the extrapolated track.

For the reconstruction of the standalone- or global-muon track, at least two measurements, one of which must be of the DT or CSC segment, must be matched within the muon system. The RPC