

Phil Allport

"The LHC will be the first accelerator to allow direct exploration of energy scales well above that characteristic of electro-weak gauge symmetry breaking. New particles with masses up to 1 TeV are predicted to be discoverable at the LHC in many models of physics beyond the Standard Model. The next step at the energy frontier is likely to be a very high luminosity hadron collider at the LHC energy (the Super-LHC) able to explore this new physics with a higher mass reach and higher statistical accuracy. The science programme at such a facility would also be highly complementary to that of a TeV-scale linear e^+e^- collider.

With instantaneous luminosities planned to exceed the design values at the LHC by nearly a factor of 10, severe issues of detector radiation tolerance and read-out granularity are faced by the tracking systems for detectors at the S-LHC. Both the General Purpose Detectors (ATLAS and CMS) will need to install new tracking systems to cope with these challenges and take optimal advantage of the increased physics reach.

Construction is envisaged to start at the beginning of the coming decade with a view to data taking at the S-LHC starting in 2015. This result in a number of research programmes being urgently required to allow sufficiently robust and affordable replacement tracking detector designs to be developed in time. The challenges faced and some of the programmes to address them will be outlined in this presentation."