APR16-2016-000976

Abstract for an Invited Paper
for the APR16 Meeting of
the American Physical Society

Status of the Future Circular Collider Study

MICHAEL BENEDIKT, CERN

Following the 2013 update of the European Strategy for Particle Physics, the international Future Circular Collider (FCC) Study has been launched by CERN as host institute, to design an energy frontier hadron collider (FCC-hh) in a new 80-100 km tunnel with a centre-of-mass energy of about 100 TeV, an order of magnitude beyond the LHC's, as a long-term goal. The FCC study also includes the design of a 90-350 GeV high-luminosity lepton collider (FCC-ee) installed in the same tunnel, serving as Higgs, top and Z factory, as a potential intermediate step, as well as an electron-proton collider option (FCC-he). The physics cases for such machines will be assessed and concepts for experiments will be developed in time for the next update of the European Strategy for Particle Physics by the end of 2018. The presentation will summarize the status of machine designs and parameters and discuss the essential technical components to be developed in the frame of the FCC study. Key elements are superconducting accelerator-dipole magnets with a field of 16 T for the hadron collider and high-power, high-efficiency RF systems for the lepton collider. In addition the unprecedented beam power presents special challenges for the hadron collider for all aspects of beam handling and machine protection. First conclusions of geological investigations and implementation studies will be presented. The status of the FCC collaboration and the further planning for the study will be outlined.