Contribution ID: **78** Type: **not specified**

The Compact Linear e^+e^- Collider (CLIC)

The Compact Linear Collider (CLIC) is a TeV-scale high-luminosity linear e^+e^- collider studied by the international CLIC and CLICdp collaborations hosted by CERN. CLIC uses a two-beam acceleration scheme, in which normal-conducting high-gradient 12 GHz accelerating structures are powered via a high-current drive beam. For an optimal exploitation of its physics potential, CLIC is foreseen to be built and operated in stages. The initial stage will have a centre-of-mass energy of 380 GeV, with a site length of 11 km. The 380 GeV stage optimally combines the exploration of Higgs and top-quark physics, including a top threshold scan near 350 GeV. A higher-energy stage, still using the initial single drive-beam complex, can be optimised for any energy up to 2 TeV. Parameters are presented in detail for a 1.5 TeV stage, with a site length of 29 km. Since the 2018 ESPPU reporting, significant effort was invested in CLIC accelerator optimisation, technology developments and system tests, including collaboration with and gaining experience from new-generation light sources and free-electron lasers. CLIC implementation aspects at CERN have covered detailed studies of civil engineering, electrical networks, cooling and ventilation, scheduling, and costing. The CLIC baseline at 380 GeV is now 100 Hz operation, with a luminosity of 4.5×10^{34} $\mathrm{cm}^{-2}\mathrm{s}^{-1}$ and a power consumption of 166 MW. Compared to the 2018 design, this gives three times higher luminosity-per-power. The new baseline has two beam-delivery systems, allowing for two detectors operating in parallel, sharing the luminosity.The cost estimate of the 380\,GeV baseline is approximately 7.17 billion CHF. The construction of the first CLIC energy stage could start as early as 2033 and first beams would be available by 2041, marking the beginning of a physics programme spanning 20-30 years and providingexcellent sensitivity to Beyond Standard Model physics, through direct searches and via a broad set of precision measurements of Standard Model processes, particularly in the Higgs and top-quark sectors. This report summarises the CLIC project, its implementation and running scenarios, with emphasis on new developments and recent progress. It concludes with an update on the CLIC detector studies and on the physics potential in light of the improved accelerator performance. The physics potential includes results from the 3 TeV energy stage, which was studied in detail for the CLIC CDR in 2012 and the CLIC Project Implementation Plan of 2018.

Authors: ROBSON, Aidan (University of Glasgow (GB)); DANNHEIM, Dominik (CERN); ADLI, Erik (University of Oslo (NO)); STAPNES, Steinar (CERN)