

Input to the CERN annual report for 2017

During 2017 the focus of the CLIC study was on preparation of a Project Implementation Plan (PiP) for the project, which will form the basis for the collaboration's input to the 2019 European Strategy for Particle Physics (ESPP). In this context new working groups for Civil Engineering and Infrastructure, Main Linac and module design and hardware, Parameters and Design baselining, Novel Accelerator Technology studies for linear colliders and Cost & Power were set up to provide project wide summaries of these topics for the Project Implementation Plan. These are additions to already existing technology and performance studies for the machine. The layout and the editorial team for the CLIC PiP were defined.

In parallel a systematic overview of the industrial basis for the CLIC core technologies is being compiled, opening for further development of these technologies for CLIC and other X-band based machine in the future.

Several key agreements with collaboration partners support technical developments for smaller X-band based accelerators and elements in particular related to Free Electron Lasers (FEL). The CompactLight European Commission Design Study, led by Trieste with 24 partners, for an X-band based FEL design was approved and started 1.1.2018.

Drive-beam klystrons from two manufacturers are delivered and show good efficiency but in one case with limited rate capacity. Combined tests at CERN with modulators are being prepared for 2018.

The high efficiency klystron and permanent magnet studies are reaching a level where machine elements with improved performance parameters can be included in the CLIC baseline. A baseline X-band structure is defined and cheaper production methods are being studied. Nano-beam tests in ATF2, FEL and Light-sources have continued and steady progress is being made. CERN and several CLIC collaborating institutes support participate in ATF2 generally and with specific hardware and dedicated studies with relevance for both CLIC and ILC.

The X-band test-stands, inside and outside CERN, are successfully used for extensive tests and industrial qualification of CLIC accelerating structures.

The CLIC module programme was presented in IPAC 2017 and the baseline module being defined both for drive-beam and klystron versions.

The CLIC test facility (CTF3) successfully completed its programme in 2016. During 2017 the CTF3 results have been summarised in an invited IPAC 2017 presentation and CERN-ATS seminar. The results will also be summarised in the CLIC PiP. The CLEAR beam facility has become operational during 2017 and has provided good results in the second half of the year.

The CERN and European ILC efforts have been followed up through 2017 and adapted to the current technical priorities for the project. A potential European ILC effort in the case Japan move forward with the project was presented to the CERN Council in Sept 2017. In this context LC study members at CERN have followed and participated in key activities of the Japanese ILC preparation office, for site specific design and costing. A new common initiative between CERN and KEK was started for increasing klystron power efficiencies.