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Photoinjector activities at CERN

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The Compact Linear Collider (CLIC) is under study at CERN in a collaboration between many institutes. For developing the technology needed for CLIC a dedicated test facility (CLIC test facility 3, CTF3) is currently in operation at CERN, which contains also two RF photoinjector installations. The CALIFES photoinjector for the CTF3 main beam provides beam for two-beam acceleration experiments on a daily basis, whereas the PHIN photoinjector was installed at an off-line test stand for studying its feasibility as an electron source for the CTF3 drive beam. Having reached most of the CTF3 drive beam requirements, the focus of the studies at PHIN has now shifted towards feasibility studies for the CLIC drive beam, which requires a high bunch charge of 8.4 nC and 0.14 ms long macro pulses with 50 Hz repetition rate and 2 ns bunch spacing. This corresponds to a total charge of 0.59 mC per macro pulse, which is challenging with respect to the photocathode lifetime. Therefore, an extensive photocathode R&D program is in progress, for which a dedicated photoemission laboratory including a DC electron gun and a test beam line is available. This talk will give a general overview of the photoinjector activities at CERN with a focus on the PHIN studies and the photocathode R&D.

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