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Laser driver for CTF3 photo-injectors

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Future compact linear electron-positron collider (CLIC) is under development at CERN in collaboration with many institutes worldwide. CLIC test facility (CTF3) is now under operation at CERN and it is a test bench for CLIC feasibility studies. Two RF photo-injectors are operated at CTF3: prototype for CLIC main beam – CALIFES, and prototype for CLIC drive beam –PHIN. Both photo-injectors are driven by one Nd:YLF laser installation which is described in present talk. The laser consists of a passively mode-locked oscillator which delivers 8ps pulses with 1.5GHz repetition rate synchronized with 3GHz klystron, 10W output preamplifier and final diode pumped amplifiers operated in a burst mode - one for CALIFES (5mm diam, 6kW 500us pump) and two for PHIN (7mm diam, 16kW 500us pump and 10mm diam, 22kW pump). CALIFES photo-injector requires pulse trains with a duration 1-200ns with an UV energy up to 2uJ/pulse, PHIN photo-injector can be operated either on 2nd harmonic (green light) or 4th harmonic (UV light) and requires pulse trains from 50ns to 5us with an energy up to 1uJ/pulse.

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