

A Compact GHz Laser for a Polarized Electron Injector, H. AVRAMOPOULOS, M. CIARROCCA*, NTUA, C.N.PAPANICOLAS, IASA, Athens, GR - We have developed a compact, mode-locked, semiconductor based laser oscillator suitable for use with semiconductor photocathodes (eg GaAs). It is optimized to produce chopped polarized beams for cw electron accelerators. This system is compact and stable and far easier to install and maintain than large frame systems based on laser dye or solid state technology. The cavity contains two semiconductor gain elements. High power, short pulses cannot be produced directly with a single amplifier. Our compound cavity allows mode locking at a repetition rate that matches that of the RF source, with rates of up to at least 2.5 GHz. It generates optical pulses of duration below 100 ps, at a centre wavelength of 845 nm with average optical power above 100 mW. The operating wavelength can be altered by changing the gain elements which are available commercially and each set allows > 5 nm tuning range. We will report on the latest performance figures and discuss recent improvements concerning stability, pulse parameter tuning and long term use.

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