The Photocathode Laser

In collaboration with Max-Born-Institute Berlin

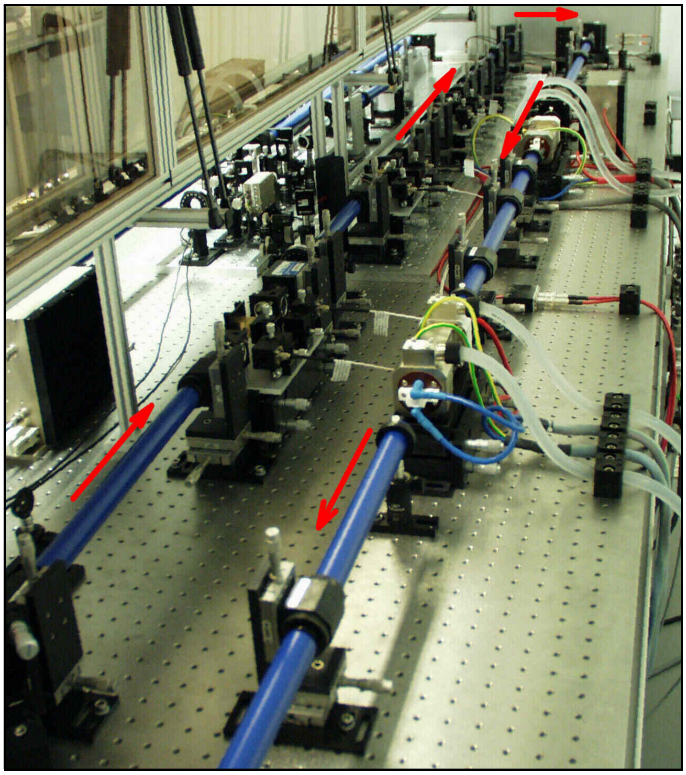
Present status:

At TTF:

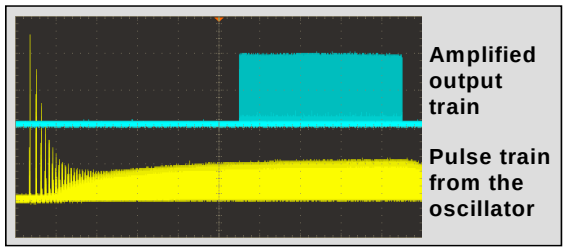
- Flashlamp-pumped laser system has been working now since 1997
- A new laser similar to the system at PITZ will be installed in Nov./Dec. 2003

At PITZ (DESY Zeuthen):

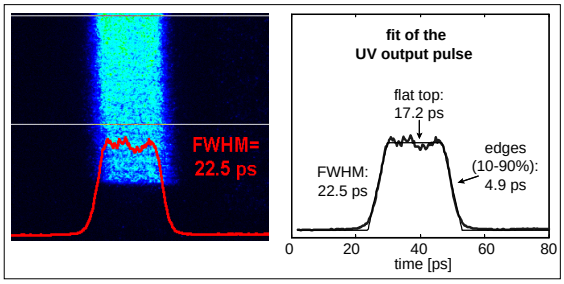
- Most advanced photocathode laser presently in operation and fully tested
- Contains diode-pumped oscillator and diode-pumped preamplifiers
- Large flexibility of the duration of the generated pulse trains
- Precise synchronization (< 1 ps) to the RF clock of the Linac achieved
- Remote controlled system
- Very high stability and reliability
- Next step foreseen in 2004: completely diode-pumped system



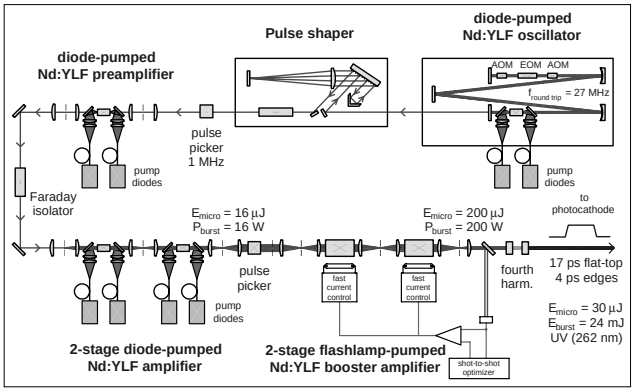
The Amplifier chain of the present PITZ laser



Output pulse trains measured at the PITZ photocathode laser

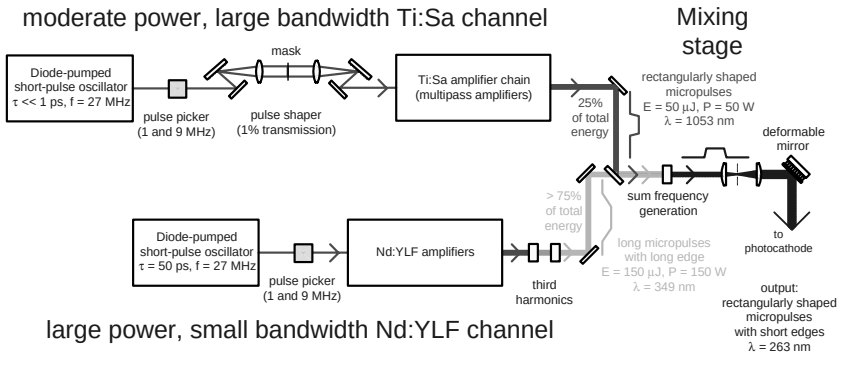


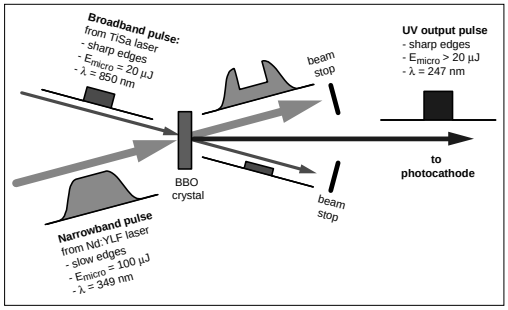
Streak camera measurement showing the flat-top micropulses of the PITZ laser



Optical scheme of the new photocathode laser presently under test at PITZ

Long-term goal: Two-channel Mixing Scheme





Aim:

- Shorter rising and falling edges of the micropulses
- Smoothing of the remaining intensity fluctuations in the flat-top region of the pulses
- 25% of the total laser energy delivered by the rectangular pulse channel
  75% delivered by the strong long-pulse channel

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