

ELI Beamlines L1 ALLEGRA laser: experience with operation of high energy, 1 kHz, 15 fs OPCPA based system for user experiments

Monday, 18 September 2023 16:45 (20 minutes)

L1 ALLEGRA system has been regularly and reliably operating for user experiments offering over 20 weeks of user beamtime per year. The laser generates 15 fs pulses with energy of up to 50 mJ and repetition rate of 1 kHz. Since the laser is completely based on OPCPA pumped by 3 ps pulses, it has inherently very high picosecond temporal contrast. The output pulse energy is limited by the availability of the suitable high energy pump laser. For this purpose we are currently developing a multipass Yb:YAG thin disk amplifier which should enable us to increase the final pulse energy of the L1 Allegra laser to 100 mJ at 1kHz, providing up to 6.6 TW peak power.

We will also present newly developed FSYNC laser with 10 mJ energy that is synchronized with L1 Allegra and can provide pulses with adjustable delay in the second beam for pump-probe type experiments.

Primary author: BAKULE, Pavel (ELI Beamlines Facility, Extreme Light Infrastructure ERIC)

Co-authors: Dr ANTIPENKOV, Roman (ELI Beamlines Facility, Extreme Light Infrastructure ERIC); Dr BOGE, Robert (ELI Beamlines Facility, Extreme Light Infrastructure ERIC); Dr NOVÁK, Jakub (ELI Beamlines Facility, Extreme Light Infrastructure ERIC); Mrs ERDMAN, Emily (ELI Beamlines Facility, Extreme Light Infrastructure ERIC); Dr GREEN, Jonathan Tyler (ELI Beamlines Facility, Extreme Light Infrastructure ERIC); Mr INDRA, Lukáš (ELI Beamlines Facility, Extreme Light Infrastructure ERIC); Ms GRENFELL, Annika (ELI Beamlines Facility, Extreme Light Infrastructure ERIC); Dr RUS, Bedrich (ELI Beamlines Facility, Extreme Light Infrastructure ERIC); Mr ŠOBR, Václav (ELI Beamlines Facility, Extreme Light Infrastructure ERIC); Mr SZUBA, Wojciech (ELI Beamlines Facility, Extreme Light Infrastructure ERIC); Mr TYKALEWICZ, Boguslaw (ELI Beamlines Facility, Extreme Light Infrastructure ERIC)

Presenter: BAKULE, Pavel (ELI Beamlines Facility, Extreme Light Infrastructure ERIC)

Session Classification: WG2: Laser technology (WP6 - Task2)

Track Classification: WG2: Laser technology