

**E1 call 1 user experiments, kHz lasers and parameters**

**L1 Allegra - brief description and expected parameters**

L1 Allegra (figure 1) is based on amplification of picosecond pulses in broadband OPCPA and compressed to <20 femtosecond using chirped mirrors. The pump lasers are based on Yb:YAG thin disk technology. The expected main L1 parameters available for call 1 user experiments are summarized in the table 1 and figure 2. More information on the system can be found here ([ELI website](#))

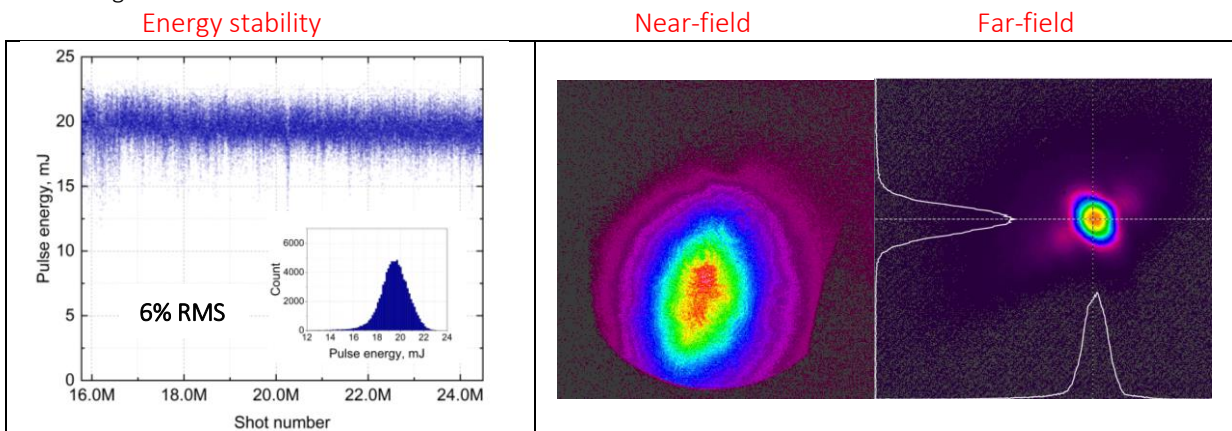


Figure 1: L1 Allegra laser.

Table 1: Parameter, at laser output, **Call 1, Early user experiments, Sept.-Dec. 2020**

Pulse energy	Rep. rate	Pulse duration	Beam pointing	Central wavelength	Beam profile	Pre-pulse temporal contrast	Polarization
>15 mJ	1 kHz	<20 fs (best effort 16 fs)	5 $\mu$ rad	860 nm	Gaussian-like 30 mm at 1/e <sup>2</sup>	10 <sup>-10</sup> (up to 5 ps before pulse)	Linear s-pol. (can be rotated in BT)

In addition to the maximum power modes, Allegra can operate in a 1 mJ alignment mode and a 5 mJ low power mode. For pump probe experiments, part of the L1 beam can be split off the main beam and converted according to the needs of the user.



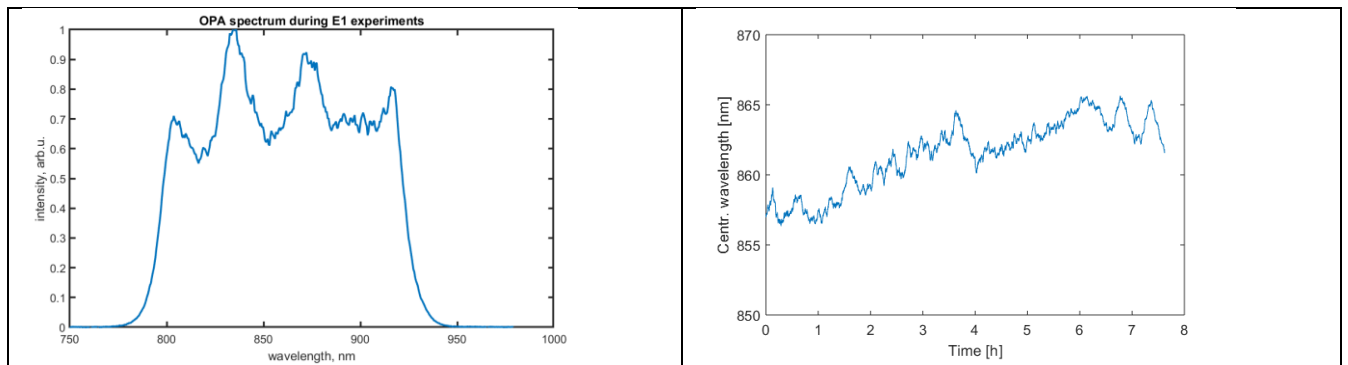


Fig 2: Selected performance parameters. Top left: pulse energy and stability (<5% fluctuations, RMS, over 3 h). Top right: Beam profile, near field. Bottom left: spectrum. Bottom right: Spectral drift ("center of mass" over 90 minutes).

For call 1 experiments L1 ALLEGRA operational hours are expected to be: 09.30 to 19.00, Monday to Friday. Reduced abilities for advanced operations and problem solving after 17.00.