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# Plasma-Modulated Plasma Accelerator (P-MoPA)

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The drivers for laser plasma accelerators (LPA) are typically based on Ti:Sa technology, which is limited to repetition rates in the lower Hz range for high energies and to average powers of ~100 W. In contrast, modern Yb:YAG thin disk laser technology offers a magnitude higher average powers and repetition rates in the kHz range, combined with a high electrical-to-optical efficiency. The bottleneck of this technology is the typically picosecond long pulse duration, which forbids an efficient drive of a plasma wave.
Here, we present a new, three-stage approach for converting a picosecond long pulse of a modern Yb:YAG thin disk laser into a train of femtosecond-class pulses, which can then be used to resonantly drive a GeV-scale, multi-kHz LPA. To experimentally prove the approach and to explore its potential, we are using two state-of-the-art Yb:YAG laser systems located at the CALA facility of the Ludwig-Maximilians-Universität München (LMU). This allows us to scan for a wide range of parameters, with repetition rates of 1 kHz or 10 Hz, pulse energies from 120 mJ to 4 J, and pulse durations between 37 fs and 1 ps.

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