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KALDERA: A high-average power drive-laser for laser plasma acceleration

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KALDERA is a novel TW-class Ti:Sapphie laser currently under development at DESY with the goal to drive a next-generation of high repetition-rate, high average-power laser-plasma accelerators. We report on the current development status of KALDERA and present commissioning results of the first 700 mJ / 100 Hz amplifier stage and its high power broadband multilayer-dielectric grating compressor supporting pulse lengths below 30 fs. We discuss the associated technology challenges concerning such as pump lasers, amplifier architecture (cooling concept) and broadband high-power pulse compression. Finally, we provde an outlook of the next development, which will deliver 100 TW peak power pulses at 100 Hz and repetition rate and beyond.

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