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KALDERA – High average power laser plasma accelerator project at DESY

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A key next step in advancing the technology of laser plasma accelerators (LPA) is to show that they can be operated at high average power, i.e., high repetition rate of kHz and higher. Previous workshop reports on laser technology for accelerators and national and international roadmaps have all advocated for the need for such systems. The rapid advances in laser technology are now making it possible to develop high peak power (>100 TW), high average power (>1 kW) lasers. Building on the significant progress that has been achieved in improving the reliability of LPAs with 1-5 Hz repetition rate lasers, such repetition rates will enable feedback control to reach even higher levels of stability and reliability. We will discuss technology requirements and plans for developing the multi-kW KALDERA laser at DESY, its integration into the SINBAD facility and the ATHENA project, as well as on the plasma source technology that will be required.

Primary author: LEEMANS, Wim (DESY)

Co-authors: MAIER, Andreas (CFEL/UHH); Dr WINKELMANN, Lutz (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); Dr LANG, Tino (Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany); HARTL, Ingmar (DESY); ASSMANN, Ralph (DESY); OSTERHOFF, Jens (Deutsches Elektronen-Synchrotron DESY); WALKER, Paul Andreas (DESY); DORDA, Ulrich (DESY)

Presenter: LEEMANS, Wim (DESY)

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