

Diode Laser Pumps for Advanced Accelerators

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Diode laser pumps are a critical technology for advanced accelerators based on plasma acceleration, and essential system components when higher repetition rate operation is needed. They are a significant cost element in larger systems, and there is only a limited number of commercial suppliers who can support the needs of emerging systems and applications.

An overview of progress in research and industry is presented, summarizing status of the technology, focusing on efforts to economically scale peak and average power and to enable new options in plasma acceleration, for example the use of Thulium-doped gain media with its pumping wavelength at 780 nm. Development needs to support the accelerator community will be collected, covering topics such as efforts to lower cost in €/W by raising the diode laser output power, to increase repetition rates to 100 Hz and even up to 1 kHz, to scale TRL of emerging diode laser technologies, to ensure low-failure-rate operation of large systems and to ensure security of supply.

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