

Single cycle and Exawatt Lasers

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Efficient multistage compression of petawatt laser pulses, such as those becoming available at laser facilities around the world, holds the promise of exawatt, X-ray pulses. A shorter route to the generation of Schwinger intensities with current day technology is now envisioned with the capability of producing high energy radiation and particle beams of extremely short, sub-attosecond timescales. The energies and timescales involved are far from traditional laser regimes and offer a new intersection of laser technology with the study of the structure of vacuum and numerous applications to subatomic physics. With this vision in mind, the two-stages of the planned petawatt pulse compression scheme shall be presented and the early work studying their feasibility discussed.

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