

# Generation and Applications of Ultrahigh-Intensity Laser Pulses

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## Problem Set 9

### 1. High Power Laser Designs

- Describe the setup of a master-oscillator power-amplifier (MOPA) laser system. Can you give an example for high-power lasers relying on this approach?
- Compare it to a chirped-pulse amplifier (CPA). What are the (dis-)advantages of CPA?

### 2. Pulsed Lasers

Which methods to generate laser pulses do you know? Give explain their basic setup and which pulse durations one can expect from each approach. Which techniques are the most relevant for high-power laser systems?

### 3. Q-Switching

Plot the inversion over time for a Q-switched laser in a schematic way. Where does the maximum of the laser pulse occur?