FDIT209uj Recent trends in laser developments

Description:
This course intends to get deeper into specialized topics related to high peak power laser systems.

Topics:

Introductory of the subjects

Description and modelling of an Öffner-stretcher

- IE3QE5_454_Treacy_Optical Pulse Compression With Diffraction Gratings
- IE3QE23_59_Martinez_3000_Times Grating Compressor with Positive Group Velocity Dispersion
- JOSAB1_1003_Martinez_Negatíve_group_velocity_dispersion_using refraction
- JOSAB19_679_Jiang_Evaluation of chirped-pulse-amplification systems with Offner triplet telescope stretchers
- Öffner patent – US3748015
- QE47_705_Zuev_Offner stretcher for the PEARL laser facility
- RevLasEng36_1053_Yang_Stretcher Design for the SGII Petawatt Upgrade Laser Facility (Martinez Vs Öffner stretcher)

Ultra broadband second harmonic generation

- APB50_51_Szabo_Broadband Frequency Doubler
- JOSAB13_1431_Osvay_Broadband sum-frequency generation by chirp-assisted group-velocity matching
- OC166_113_Osvay_Efficient tuneable bandwidth frequency mixing using chirped pulses
- OL_497_Richman_Boradband SHG by achromatic disp comp with prisms
- OptQE28_83_Ross_Efficient broad-bandwidth frequency mixing in dispersive media

Contrast degradation due to scattering from diffraction gratings

- AO62_7544_Hu_Influence of optical surface distortion in a cylindrical Offner stretcher on the far-field signal-to-noise ratio
- JOSAA36_1735 Schanz_Picosecond contrast degradation by surface imperfections in chirped-pulse-amplification stretchers
- JOSAB16_188_Bagnaud_Infuence of optical quality on chirped-pulse amplification: characterization of a 150-nm-bandwidth stretcher
- JOSA_B29_1125_Bromage_Temporal contrast degradation at the focus of ultrafast pulses from high-frequency spectral phase modulation
- OE19_2193_Hooker_Improving coherent contrast of petawatt laser pulses
- OE22_29363_Tang_Transmission grating stretcher for contrast enhancement of high-power lasers

OE25_21201_Li_Scattering pulse-induced temporal contrast degradation in chirped-pulse amplification lasers

Prepulse generation from postpulse – an interplay between CPA and nonlinear optics

AO_60_8408_Cupal_Temporal prepulse contrast degradation in high-intensity CPA lasers from anisotropy of amplifier gain media

AO62_7791_Chen_Delay-shift and asymmetric broadening of pre-pulses by post-pulses in a petawatt laser facility

OE16_3178_Didenko_Contrast degradation in a chirped-pulse amplifier due to generation of prepulses by postpulses

OE16_8876_Schimpf_Decrease of pulse-contrast in nonlinear chirped-pulse amplification systems due to high-frequency spectral phase ripples

OL41_4441_Khodakoskiy_Degradation of picosecond temporal contrast of Ti:sapphire lasers with coherent pedestals

Broadband PW lasers – laser crystals with different doping

AO49_1676_Texas 1PW laser

AO51_2150_Conceptual design of a 10 PW laser

AO63_7923_Zhang_Gain performance and thermal effects of Nd:Glass and Nd,Y:SrF2 crystal

OE19_20953_Filip_Atomic phase shifts in mixed-glass, multipetawatt laser systems

Towards high peak power and high average power – beam multiplexing

AO054_4640_Soulard_Design and properties of a coherent amplifying network laser

EPL_94_440002_Banici_Spectral combination of ultrashort laser pulses

National Ignition Facility Laser System Performance

OL45_3083_Mueller_10.4 kW coherently combined ultrafast fiber laser