

Ma 14 - Solid State Laser

Physics:

- Light Amplification by Stimulated Emission of Radiation
- Einstein coefficients, population inversion, three and four level system
- Cavity or optical resonator, TEM_{nm}, stability criterion
- pn-junction and semiconductor lasers, dependence on temperature and current
- Second harmonic generation, phase matching conditions
- Pulsed laser, Q-switching and mode locking

Technical:

- Diode pump laser
- Nd:YAG laser
- Second harmonic generation in KTP crystal
- Pulsed laser, Pockels cell

Data analysis:

- Power calibration
- Extract the threshold pump power and slope efficiency (fits)
- Identify transversal modes by numerical simulation
- Characterize the form of a single pulse