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**UNIVERSITÄT
BERN**

Seminar über Ultrafast Science and Technology

Referent: Sheida Mahmoodi, Institute of Applied Physics, University of Bern

Titel: Thulium Doped Fiber Laser Mode-locked by Graphene Saturable Absorber

Ultra-short pulsed fiber lasers in 2 micron wavelength range have many applications in medicine, material processing and free space sensing, which is why thulium-doped fiber lasers are of great interests for such purposes. In our work we investigate techniques for the generation of ultra-short pulses in 2 micron fiber lasers. To operate a fiber laser in the ultrashort-pulse regime, a saturable absorber that acts as an ultrafast optical modulator, must be introduced into the fiber laser cavity. There are various techniques for achieving saturable absorption and to mode-lock a fiber laser. In our current work we investigate two of these techniques. Namely the mode-locking by the technique of nonlinear polarization rotation and the mode-locking with Graphene layers. A software framework allows us to scan our setup that is equipped with motorized waveplates and to prepare a high resolution 3D map of the laser operation. With these maps we can compare in details the characteristics of different configurations of our fiber laser.

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