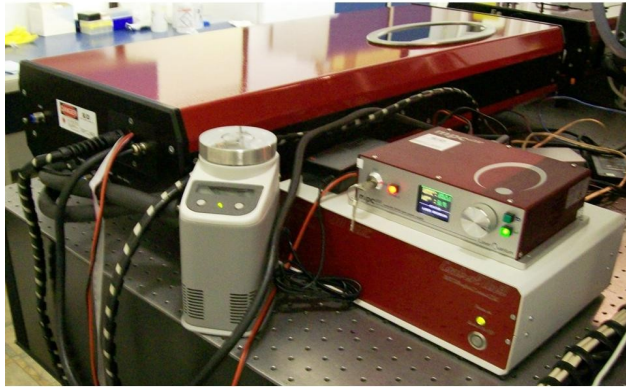


FemtoRose 300 TUN LC™

Tunable, Low Repetition Rate, Femtosecond Pulse Ti:Sapphire Laser



Key features

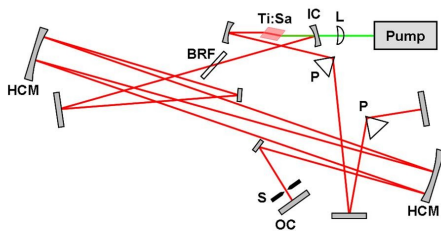
- Low pump laser cost (~ 2.6 W pumping)
- Low, 22 MHz repetition rate
- Higher fluorescence signal
- Lower thermal damage in sample
- No extra-cavity chirp control is required
- Wavelength control by a Zeiss 2P microscope

Applications

- Multiphoton microscopy
- Ultrafast spectroscopy

Our new *FemtoRose 300 TUN LC NoTouch™* laser is developed for nonlinear microscopy and time resolved spectroscopy applications. It comprises a 3 W, 532 nm pump source and a control unit, which allows hands free operation. The laser operation wavelength can be directly set by a Zeiss Axio Examiner microscope (ZEN software compatible). To best of our knowledge, this is the first femtosecond pulse, broadly tunable Ti:sapphire laser on the market operating at a ~22 MHz repetition rate. The laser utilizes our patented, ultrabroadband, ion-beam sputtered chirped mirrors for building a low loss laser cavity. The low repetition rate results in a higher signal to noise ratio, a lower photo-degradation of the biological samples and a more cost efficient construction than in case of its ~80 MHz predecessors, and hence this laser construction is ideal for *in vivo* nonlinear microscopy applications.

Schematic of the oscillator

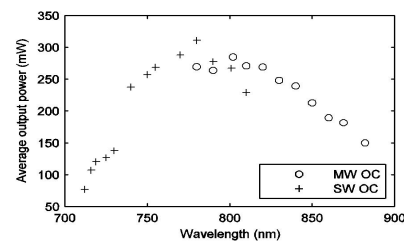


L: pump focusing lens, IC: input coupler mirror, Ti:Sa: titanium-sapphire crystal, BRF: birefringent filter for tuning, P: prisms, HCM: Herriott-cell mirrors, OC: output coupler, S: slit for hard-aperture KLM

Reference

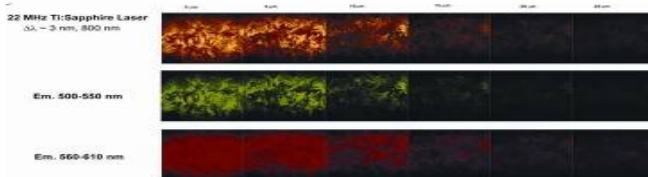
Antal P, Szilgietei A, Kolonics A, Szipöcs R; Tunable, Low Repetition Rate, Femtosecond Pulse Ti:Sapphire Laser for In Vivo Imaging by Nonlinear Microscopy; In: Optics in the Life Sciences Congress (OSA, 4-6 April 2011, Monterey, CA) Paper JTua12, 2011

Typical measured output power vs. wavelength (at 2.6 W pump)



Two different output couplers were used for short wavelengths (SW OC, crosses) and for longer wavelengths (MW OC, circles).

Application for 2P microscopy



The autofluorescence of keratin is detected by a Zeiss Axio Examiner microscope.

System Specifications (preliminary):

- Average output power (Opus™, 2.6 W): > 250 mW
- Tuning range (Opus™, 2.6 W): 715 nm to 880 nm
- Pulse duration at laser output: ~ 300 fs
- Spectral bandwidth: < 4 nm
- Repetition Rate: ~ 22 MHz, nominal
- Spatial Mode: TEM00
- Polarization: Horizontal
- Physical dimensions: 120 x 62 x 18 cm³