NANOP 2018

NANOPHOTONICS THE UBIQUITOUS SCIENCE

NANOPHOTONICS

AND

MICRO/NANO OPTICS

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ROME

BOOK OF ABSTRACTS

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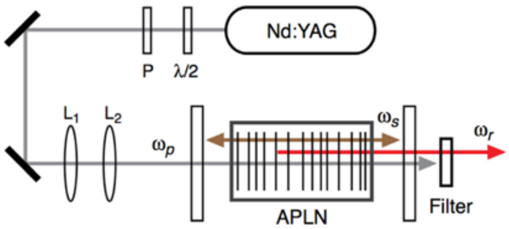
710 nm red light source based on cascaded nonlinear optical processes for use in biomedical application.

Tuesday, 2nd October @ 13:30: Poster Session (HALL & ROOM 3) - Poster - Abstract ID: 463

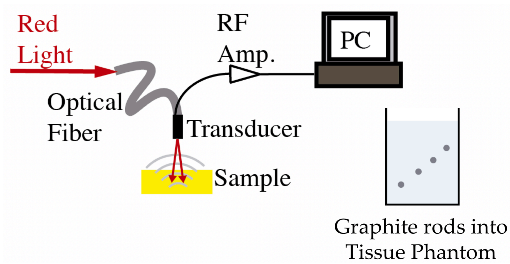
Dr. Juan Gonzalez [1], Dr. Liliana Martinez [1], Dr. Roger Cudney [2], Dr. Jose Enriquez [1], Dr. Rurik Farias [1], Mr. Eduardo Melendez [1]

1. Universidad Autónoma de Ciudad Juárez, 2. CICESE

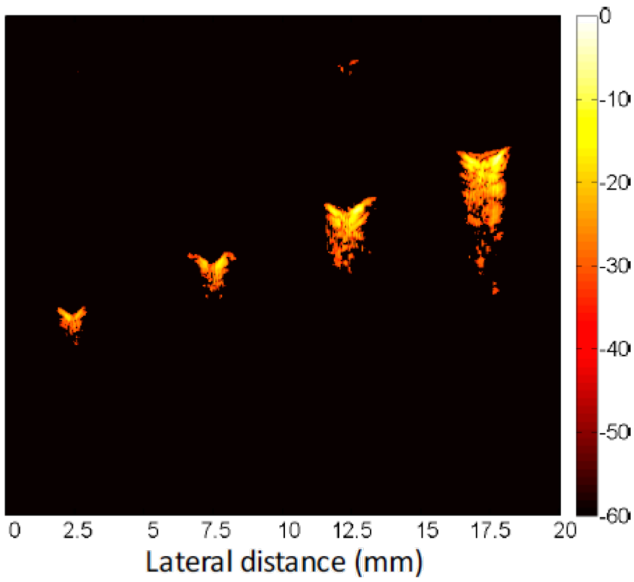
Photoacoustic imaging is a diagnostic technique which is based on the detection of acoustic waves induced in tissue by the absorption of electromagnetic radiation, usually from pulsed sources on a nanosecond timescale and with wavelengths between 600 and 900 nm. This technique can be used to detect microcalcifications in breast tissue and a wavelength between 600 and 800 nm is optimal for this particular case.In this work we present a scheme for an inexpensive and simple device that emits 9 nanosecond pulses over 1 mJ at a 710 nm wavelength which is based on an aperiodically poled ferroelectric crystal (Lithium Niobate, $LiNbO_3$) pumped with a Nd:YAG pulsed laser source to obtain the red beam and is a viable source for biomedical applications like Photoacoustic imaging. The wavelength conversion from 1064 nm to 710 nm was achieved by two cascaded nonlinear optical processes within the Lithium Niobate crystal. First by optical parametric generation at degeneracy point a signal wave with 2128 nm wavelength is generated and simultaneously a sum-frequency generation process between the pump and signal waves results in the red beam.



Red source.png



Pai 1.png



Pai 2.png