Title:	High Frequency Acoustic Signal Sensing Using Light
Authors:	Laxman, Chavan Aniket
Keywords:	Acoustic Signal Light Fiber Optics Sensor
Issue Date:	28-Jul-2021
Publisher:	IISERM
Abstract:	Photoacoustic Imaging (PAI) is a newly emerging biomedical imaging technology where a non-invasive study of a biological sample is possible. This detection method of the generated photoacoustic signal requires small in size, highly sensitive acoustic sensors capable of detecting very low-pressure amplitude signal. Traditional material-based sensors such as PVDF and its co-polymer PZT, etc., has limited bandwidth and poor signal to noise ratio(SNR). The sensitivity of This sensor changes drastically when the size of the sensing area reduces. There is an alternative search for developing low noise, large bandwidth, and highly sensitive acoustic sensors using alternative technologies. One of the notable research directions currently evolving is the optics-based large bandwidth acoustic signal detec- tion. In this direction, our lab 'Bio-Nano Photonics Lab in IISER Mohali' is studying a different kind of geometries to develop micron size optical element based ultrasound detector. In this thesis, an all-optical ultrasound sensor based on Fabry-Perot Interferometer and phase modulation are proposed to detect the photoacoustic signal. Both planer and suspended membrane designs are proposed, fabricated, and experimentally shown. Chemical etching, micro-machining, dip coating techniques, and standard communi- cation devices are used to fabricate the sensor.
URI:	http://hdl.handle.net/123456789/3908
Appears in Collections:	MS-14

Files in This Item:

File	Size	Format	
MS14187.pdf	1.57 MB	Adobe PDF	View/Open

Show full item record