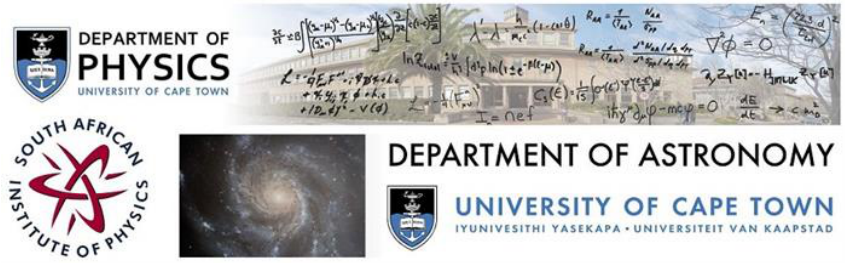

Contribution ID: **348** Type: **Poster Presentation**

A high speed OCT system developed at the CSIR National Laser Centre

Wednesday, 6 July 2016 16:10 (1h 50m)

Abstract content
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Light based techniques continue to gain momentum in different spheres of diagnostic and therapeutic applications as a result of their non-invasive, non-contact properties. One such technique is Optical Coherence tomography (OCT). Since it was first reported by Huang in 1991[1], OCT has made significant strides in different fields from dermatology and ophthalmology to polymer characterisation and bio-metrics[2-4]. In South Africa, the technique is still emerging although it is being used for eye examinations by ophthalmologists. The type of OCT system employed can be a simple, cost effective solution or a complex, highly specific and fast system depending on the application.

As part of a larger project, the CSIR National Laser Centre has designed and built a high speed OCT system that can image a large surface area (25 by 25 mm) to a depth of 11 mm (sample dependant). Resultant 3-D images (512 x 512 x 2048 pixels) are acquired in less than 3 seconds. The performance of the system compares adequately with many commercially available systems which usually image smaller areas [5-6].

The heart of the system is a 200 kHz swept laser source and two axis galvonometer based scanner. Signal acquisition is made possible through a high speed analogue-to-digital converter capable of speeds greater than 1GS/s. This paper will give an overview of the system and elaborate on the design of the data acquisition system and the initial results that have been obtained.

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Session Classification: Poster Session (2)

Track Classification: Track F - Applied Physics