Contribution ID: **406** Type: **Poster Presentation**

Simulation and analysis of spectral domain optical coherence tomography.

Thursday, 28 June 2018 15:00 (2 hours)

High-resolution 2D profiles or 3D reconstructions of cellular structures are routinely generated using an interferometric technique, Optical Coherence Tomography (OCT . The main advantages associated with OCT are its high resolution and depth of penetration, which are in the micron and millimeter ranges respectively. The main purpose of this research is to investigate the physical mechanisms associated with Spectral Domain OCT (SD-OCT) imaging in order to identify the key parameters affecting imaging performance. This was achieved through system characterization, modeling and simulation of the SD-OCT system currently under development at Stellenbosch University. The mathematical model, developed in Mathematica®, and the simulation, developed in Matlab®, allow us to observe the effect the critical parameters will have on the detected signal, which provides us with the means to quickly test the limits of the SD-OCT technique. Specific samples were simulated and verified experimentally using our SD-OCT system. We found that the model allows us to simulate a more general case due to the inclusion of the more complex interactions, which will provide the user with more information to aide in experimental work. In the future, the model limitations can be addressed, namely moving from a discretized sample to a continuous non-homogenous sample and the inclusion of the effects of system optics such as objective lenses.

Please confirm that you
have carefully read the
abstract submission instructions
under the menu item
”Call for Abstracts”
(Yes / No)

Yes

Consideration for
student awards
Choose one option
from those below.
N/A
Hons
MSc
PhD

MSc

Supervisor details
If not a student, type N/A.
Student abstract submision
requires supervisor permission:
please give their name,
 institution and email address.

N/A

Primary author: Mr COENRAAD, Wendall (Stellenbosch University)

Co-authors: Prof. ROHWER, Erich (University of Stellenbosch); Dr BOSMAN, Gurthwin (Stellenbosch University); Dr NEETHLING, Pieter (Laser Research Institute, University of Stellenbosch)

Presenter: Mr COENRAAD, Wendall (Stellenbosch University)

Session Classification: Poster Session 2

Track Classification: Track C - Photonics