

SEMINAR

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Design and Development of a Fizeau interferometer for Optical Coherence Tomography

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Abstract

Optical coherence tomography (OCT) is an optical imaging technique for medical and industrial application providing the cross sectional image of sample. It is analogous to ultrasound however, instead of using sound, light is used with a higher resolution (10-30 μ m-resolution). OCT uses interferometric signal between a reference arm and a sample arm and a reference arm, and interferences occurs when the optical path difference of the arms is within the coherence length of the source.

The Michelson interferometer is typically employed. This configuration suffers from polarisation fading (the fibre may be stretched, changing the polarisation) and is temperature-sensitive. Both effects imply that interferometric signal may not be detected.

In order to minimise these effects, the Fizeau interferometer is developed. It employs two interferometers, a sensing interferometer and a processing interferometer, working in tandem. The interference signal is observed when the optical path difference in the processing interferometer matches the optical path difference in the sensing interferometer.

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