



<http://optics.eee.nottingham.ac.uk>



The University of
Nottingham

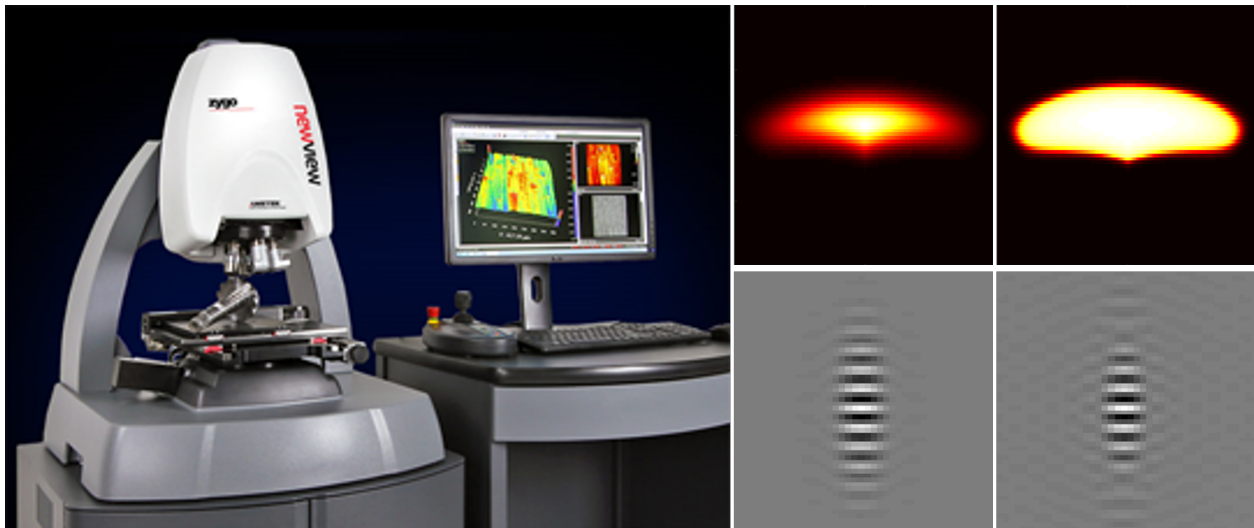
UNITED KINGDOM · CHINA · MALAYSIA

Optics and Photonics Group Lunchtime Seminar

“On tilt and curvature dependent errors and the calibration of coherence scanning interferometry”

Rong Su

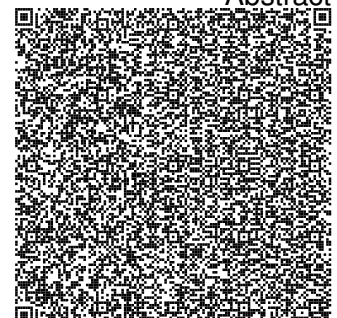
Manufacturing Metrology Team, Advanced Manufacturing Group, University of Nottingham



12:00pm Thursday 2nd February 2017
Lecture Theatre 203 Tower Building
All Welcome

http://optics.nottingham.ac.uk/wiki/Talks_2017

Abstract



“On tilt and curvature dependent errors and the calibration of coherence scanning interferometry”

Rong Su

12:00pm Thursday 2nd February 2017

Lecture Theatre 203 Tower Building

All Welcome

Although coherence scanning interferometry (CSI) (also known as white light interferometry) is capable of measuring surface form with sub-nanometre precision, it is well known that the performance of measuring instruments depends strongly on the local tilt and curvature of the sample surface. Based on 3D linear systems theory, however, a recent analysis of fringe generation in CSI provides a method to characterise the performance of surface measuring instruments and offers considerable insight into the origins of these errors. Furthermore, from the measurement of a precision sphere, a process to calibrate and partially correct instruments has been proposed. Our recent investigation presents, for the first time, a critical look at the calibration and correction process. Computational techniques are used to investigate the effects of radius error and measurement noise introduced during the calibration process for the measurement of spherical and sinusoidal profiles. It is shown that by calibrating the instrument correctly and using appropriate methods to extract phase from the resulting fringes (such as frequency domain analysis), CSI is capable of measuring the profile of surfaces with varying tilt with nanometre accuracy.