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WIDEFIELD CONFOCAL MICROSCOPE FOR SURFACE WAVE K-VECTOR MEASUREMENT

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Optical surface waves are guided light on surface of optical structures. There are several optical structures that support optical surface waves, such as nanostructures, gratings, optical waveguides and metamaterials. Optical surface waves have proven themselves very promising candidates for several applications including biosensing, optical computing and optical circuitry. The characteristics of surface wave can be characterised by the wave vector (k-vector) of the surface wave. In this talk, we will discuss how a modified confocal microscope integrated with a phase spatial light modulator allows us to measure both the real part and the imaginary part (attenuation coefficient) of the surface wave k-vector. Surface plasmon resonance (SPR) excited on a uniform gold surface through Kretschmann configuration is employed as an example in this talk. Note that the system is not limited to the SPR. It is also applicable to other types of optical surface waves. We have demonstrated in our recent publication that the modified confocal not only provides the k-vector measurement both real and imaginary, it also allows us to separate different loss mechanisms in SPR. One limitation of the system was the single point detection. Here, we will discuss the current stage of our development in widefield confocal surface plasmon microscope, which allows us to measure multiple points simultaneously. This has been achieved by integrating another amplitude spatial light modulator in the image plane of the objective lens allowing the image plane to be sequentially coded and post-processed to recover the confocal image.



Biography

Suejit Pechprasarn has received his B Engg degree in Electronic and Computer Engineering (1st class Honour) from the University of Nottingham in the UK and Electrical Engineering degree from Thammasat University in Thailand in 2007. He then commenced his Doctorate degree study at the Institute of Biophysics, Imaging and Optical Science (IBIOS), the University of Nottingham in the UK and received his PhD in 2012. He was appointed as a Postdoctoral Research Fellow at the Institute for two years before joining the Hong Kong Polytechnic University in Hong Kong SAR in 2014 as a Research Fellow until the present. Since Dec' 2014, he has also been working as an Invited Guest Lecturer and Associate Dean for Research, Innovation and Foreign Affairs at Rangsit University, Thailand. He has recently been appointed as Assistant Professor at Shenzhen University in China.

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