Fourier-domain OCT modalities based on nonlinear interferometers

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Optical coherence tomography (OCT) is a well-established imaging technique for optical depth sectioning. Recently, new techniques inspired in OCT have emerged using nonlinear interferometers such as induced coherence tomography, OCT with an SU(1,1) interferometer, and quantum-OCT. They take advantage of the quantum correlations between downconverted photons to improve the performance of the standard time-domain OCT imaging system. However, these methods require long acquisition times, which is impractical for real-life settings. A solution to this problem is to work in the Fourier domain (FD), which consists of obtaining the sample information using the output signal spectrum. In this work, we deduce practical expressions for the FD schemes of these nonclassical techniques and compare their features with the classical FD-OCT method. This work can motivate further developments in OCT and applications of nonlinear interferometers.

Biography

Jorge Arturo Rojas Santana is a Ph.D. Candidate from Tecnologico de Monterrey. He is the Optics group leader at INNBIOSYS, a premier Optogenetic company. He has a research stay at The Institute of Photonic Sciences and worked as an Associate professor at the Instituto Tecnologico de Toluca. In the last three years, he developed industry projects, participate in more than ten international congresses, and published four papers in reputed journals.

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