

Series and Parallel Interferometers for Spectroscopy Applications

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Recently, there has been a strong interest in developing optical interferometers on a chip to build integrated spectrometers for different applications. The success of miniaturization of such optical spectrometers on a chip, opens the door for the integration of multiple interferometers on a single chip in a parallel or series configuration to build a spectrometry circuit for specific / more sophisticated functions and applications. In this talk, we will address this point by considering two interferometers: the Michelson interferometers and the Fabry-Perot interferometers. We will show how the series and parallel interferometer configurations can be used to improve the spectrometer spectral range, signal to Noise ratio, or resolution and investigate the technical challenges to be solved for the practical implementation of these configurations. The discussion will be focusing on the interferometers build using the Deep Reactive Ion Etching (DRIE) Optical MEMS technology.



Short Bio:

Diaa Khalil has over 38 years of experience in micro and nano photonic systems. He obtained his PhD from INPG France in 1993. He is Professor of photonics since 2004 in ASU where he was also the Chairman of the ECE Dept., the vice dean of research and the acting dean. Currently he is the CEO of the Innovators Support fund ISF in Egypt. He supervised more than 80 MSc and PhD. From 2007 to 2020, he was the CTO of the Optical MEMS Division in Si-Ware Systems where he is currently one of the company technical advisors. He is inventor of about 25 patents and patent applications, author and co-author of more than 370 publications, 6 book chapters and 1 ebook. He is a senior member in IEEE, OSA, SPIE, URSI, and a member in the editorial board of the journal, Light: Science and Applications, produced by the **Nature** PG and associate editor of the journal of IEEE-PTL. He is a holder

of the Egyptian State appreciation prize in engineering science in 2021.