Keynote Speech 5

Multi-Function RF Filters

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Abstract – The majority of wireless base station systems are designed to support several frequency bands requiring the use of multiple filters for separating these bands. The number of filters can be reduced by either employing multi-band filters or tunable filters. In the case of multiband filters, one physical filter can be designed to have 2 or 3 simultaneous bands with enough isolation between the bands reducing the number of required filters by a factor of 2 or 3 respectively. In the case of tunable filters, one physical filter can be tuned in both center frequency and bandwidth potentially eliminating the need to use many filters. It is also feasible to realise tunable multiband filters where one physical filter offers multi bands where each band is tunable in bandwidth and center frequency. This talk presents recent developments in multiband filters, tunable filters and tunable multiband filters for wireless base station applications. Several examples of tunable filters employing technologies such as piezo motors, microelectromechanical systems (MEMS), barium strontium titanate (BST) and phase change materials (PCM) will be presented.

Raafat R. Mansour is a Professor of Electrical & Computer Engineering at the University of Waterloo and holds a Tier I - Canada Research Chair. Prior to joining the University of Waterloo in January 2000, Dr. Mansour was with COM DEV Cambridge, Ontario, over the period 1986-1999, where he held various technical and management positions in COM DEV's Corporate R&D Department. Dr. Mansour has 37 US and Canadian patents (33 are awarded and 4 pending) and over 350 referred publications to his credit. He is co-author of Wiley book on Filters for Communication Systems and contributed six chapters to four other books. He served as the Chair of the Technical Program Committee of the IEEE-IMS2012 Symposium. Dr. Mansour is a Fellow of the IEEE, a Fellow of the Engineering Institute of Canada (EIC) and a Fellow of the Canadian Academy of Engineering (CAE). He was the recipient of the 2014 Professional Engineers Ontario Engineering Medal for Research and Development.