# MICROWAVE ENGINEERING AND NEW APPROACHES IN SENSOR DESIGN USING METAMATERIALS

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**Abstract:** In the last two decades, design and applications of metamaterials have been one of the most interesting subjects in the electromagnetic research. The extraordinary properties of double negative (DNG) and single negative (SNG) materials have been studied extensively over this period. In this talk, applications of metamaterials on microwave sensors and microfluidic platforms will be discussed.

Following a brief introduction for microwave engineering, evanescent fields and near field sensor concepts will be discussed. Improvements over conventional near field sensors using metamaterials and new sensor topologies will be presented. Finally microwave components functioning as mixers, heaters, content sensors and temperature measurement in microfluidic platforms will be introduced.

**Biography:** Muhammed Boybay is an Associate Professor of Electrical and Electronics Engineering and director of Sensing and Energy Laboratory at the University of Igdir. He received his B.S. degree in Electrical and Electronics Engineering from Bilkent University in 2004, and the Ph.D. degree in Electrical and Computer Engineering from University of Waterloo in 2009. From 2009 to 2012, he was a postdoctoral fellow at the Waterloo Microfluidics Laboratory.

Prof. Boybay's research interests include development and use of metamaterials for improving microwave near field sensors, microwave material characterization, microwave energy harvesting, applications of metamaterials on antenna technologies and microwave component development for microfluidic platforms and Lab on a Chip applications. He co-authored more than 50 journal and conference papers. He was PI of several externally funded projects in the area of microwave sensor development and microfluidics.

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