



Seminar of Prof. Wang Wen

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SAW sensors and their applications for multi-parameters sensing: Gas, Icing, Magnetic field, and Temperature

July 2, 2026 at 2:30 p.m. in the P. Alnot Room 4-A014, IJL, Campus ARTEM

Abstract: Surface acoustic waves (SAWs) are mechanical acoustic waves that propagate along the surface of a piezoelectric medium, generated by micro-nano interdigitated electrodes deposited on the surface of the piezoelectric medium using the piezoelectric effect. Due to the high frequency, excellent reciprocity and symmetry of the interdigitated electrodes, as well as the simplicity and flexibility of the design, and the use of semiconductor planar lithographic technique, SAW devices, as key components in signal processing, have become crucial analog components in fields such as mobile communications and radar, with an annual market application scale exceeding tens of billions. Additionally, because acoustic energy is concentrated on the surface of the medium, it is extremely sensitive to surface loads, forming another important development direction of SAW technology, namely intelligent sensing. Compared to other sensing technologies, SAW sensors have technical advantages such as high sensitivity, fast response, wide measurement range, and high reliability. In particular, they can provide a novel sensing method that is passive (senses without power supply), and transmits wirelessly, which has attracted widespread attention and great interest. After nearly 30 years of development, a large number of SAW sensors have been successfully applied in special fields such as national defense, power, intelligent manufacturing, aerospace, and more, for in-situ detection of multiple parameters such as temperature, mechanics, and gas, demonstrating significant application value. This presentation will focus on reporting the research and sensor applications of SAW multi-parameter sensing effects, mechanisms, devices, and system integration, including gas, icing, magnetic field, and temperature sensing, based on the research results of the laboratory team.

Biography : Wang Wen, Ph.D., Professor of the Institute of Acoustics, Chinese Academy of Sciences/University of Chinese Academy of Sciences (CAS), IEEE Senior Member, International Advanced Materials Association Fellow, Fellow and Executive Director of the Acoustical Society of China, Vice Chairman of the Physical Acoustics/Microacoustics Branch, Director of the China Society for Micro-Nano Technology, and Vice Chairman of the Acoustic Sensing and Instrumentation Specialty Committee of the China Instrument and Control Society. Published over 140 SCI papers; Edited 2 monographs; Applied for/granted over 80 invention patents; Received over 10 international and domestic science and technology awards including the Humboldt Research Achievement Award, the IAAM Scientist Medal, the Wei Rongjue Award, the Technical Leading Figure Award of the China Electronics Components and Systems Association, the Beijing Science and Technology Progress Award, and the Military Science and Technology Award; selected as a national and CAS innovation leader; Awarded the Zhu Liyuehua Excellent Teacher Award and the Excellent Tutor Award of the CAS.

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