Abstracts

A Short History of Microwave Acoustics

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Microwave acoustics may be defined as the subject embodying the propagation of acoustic waves in solid-state materials at-micron-order wavelengths where analysis, design, and componentry realizations are similar to those used by the microwave engineer exploiting electromagnetic waves. Microwave acoustics has a short history, being about 25 years old, but is underpinned by the theory of sound propagation due to Lord Rayleigh of 100 years ago. Microwave acoustic components inherently have several distinct physical origins including volume acoustic waves in solids excited by piezoelectric thin-film transducers and magnetic propagating modes in yttrium iron garnet, both at conventional microwave frequencies; the later surface acoustic-wave (SAW) technology for operation at VHF/UHF and the realm of acoustooptics, which can embody any of the earlier three. Over its 25-year history, microwave acoustics has matured to become a necessary building-block in many radar and communication systems for efficiently carrying out real-time analog signal processing. Contributions to microwave acoustics have been truly international and have spanned many diverse disciplines. The growth of this subject has led to the formation of several companies dedicated to its application.

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