Abstract:
An accurate understanding of the reflection behavior of leaky surface acoustic waves (LSAW) is of particular interest in order to develop sophisticated computer aided design (CAD) tools. Thus, we have analyzed the propagation and reflection characteristic of LSAW under periodic metal grating structures. The electrically and mechanically induced reflections, as well as the anisotropy of the substrate material, are rigorously taken into account. Consequently, the second order effects associated with the generation of evanescent and propagating bulk modes have to be included. The reflection coefficient and the phase velocity shift are directly calculated from the dispersion relation and are analyzed for open and short circuited electrodes, different metallization ratios, and normalized metal electrode thicknesses, respectively. Numerical and experimental results for the single electrode reflection coefficient are given for aluminum electrodes on 36rot YX LiTaO$_3$ substrate.

Stichworte:
AI, Al electrodes, CAD, CAD tools, computer aided design tools, evanescent bulk modes, leaky surface acoustic wave reflections, LiTaO$_3$, periodic metal grating structures, phase velocity shift, propagating bulk modes, propagation characteristic, reflection characteristic, surface acoustic wave devices, surface acoustic wave filters, ultrasonic devices, ultrasonic propagation, ultrasonic reflection.

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