Abstracts

Wideband RF Channelization Using Frequency-Dependent Beam Steering of Focused Bulk Acoustic Waves

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Development of wideband transducers coupled with frequency dependent beam steering of Bulk Acoustic Waves (BAW) in low loss single crystals provide a great opportunity for efficient channelization of broad band microwave signals. Due to material anisotropy, phase and group velocity collinearity represents in many instances a constraint that must be taken into account in a given design. The work presented in this paper deals with the diffraction process in BAW channelizers/spectrum analyzers in a general way. Our diffraction model is based on Huygen's principle to predict the pressure field in a longitudinal device for various input frequencies. The formulation is applied to compute generalized wave disturbances due to an apodized/unapodized linear phased input array and a curved reflector. The material is YAG where parabolic approximation to the slowness curve is valid for the required steering angles.

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