Abstracts

Linear Signal Processing by Acoustic Surface-Wave Transversal Filters

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The impulse response of acoustic surface-wave (ASW) filters is determined by the configuration of an array of planar transducers tapping the acoustic signal propagated in the piezoelectric substrate. The transducer configuration is derived here by applying the general procedure used for the synthesis of linear transversal filters, which consists in time sampling the required impulse response and arranging the spacing and weights of the taps according to the time intervals and amplitudes of the impulse-response samples. The design of the tapping structure that synthesizes the impulse response of ASW transversal filters is based on a nonuniform sampling procedure, previously developed by the authors, that meets the particular requirements of ASW device operation. The features of this design procedure are presented, and several geometries of tapping transducers corresponding to impulse responses of different characteristics are discussed. The application of the procedure to the design of typical ASW filters is illustrated by the results of experimental models.

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