Abstracts

Precision SAW Filters for a Large Phased-Array Radar System

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The electronically steerable radar (ELRA) at the Forschungsinstitut fur Funk und Mathematik is an experimental S-band phased-array radar system consisting of separate transmitting and receiving arrays employing several coherent and incoherent signal-processing and data-handling techniques, incorporating multiple beam and multifunction operation for target search and tracking, adaptive interference suppression, and target resolution. This paper deals with the development and application of two types of SAW filters for the IF amplifier channel of the receiving array. Compared to conventional filters with lumped elements, these filters have some important merits. By making use of a special tuning technique, the center frequencies of all filters were adjusted, resulting in an rms deviation of less than 1 kHz. One type of the SAW filters represents an almost ideal approach of realizing a matched filter for rectangular shaped pulses. The conformity of the frequency responses of several hundred filters improved the noise suppression capability of the system. The use of the filters described represents one of the applications where high-quality mass-produced SAW devices have been applied to improve system reliability and performance.

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