FREQUENCY INVARIANT BEAM PATTERNS USING FRACTIONAL FOURIER TRANSFORM

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Abstract

The beamwidth of a linear array depends on number of elements in the array and frequency of the input signal. At present designing of wideband antennas and beamformers become important, in the fields of microphone arrays intended for teleconferencing, in transmitting or receiving spread spectrum signals etc. Frequency independence implies that the main beam pattern should be constant even there is a change in input signal frequency. Various methods were proposed in literature, one method is called elemental lowpass filtering designed by using Finite Impulse Response (FIR) digital filters. In this paper, we proposed a new designing method for elemental lowpass filtering using Fractional Fourier Transform (FRFT). The results obtained using FRFT filter design of wideband antennas is superior compared to FIR filter method.