A radar system is generally implemented and addressed to detect the target of concern. So, in a radar system, analysis and application of Ultra Wide Band (UWB) signals solves most of the problems of radar target detection. Since multiple-input multiple-output (MIMO) radar possess significant potentials for fading mitigation, resolution enhancement and interference and jamming suppression, by operating the MIMO radar with UWB signals it is expected that the resolution capability of the radar system improves significantly. These radars are generally called as Hybrid-MIMO radars. Due to the time resolution and the frequency dependence of the scattering centers over the potentially large bandwidth greater information can be obtained. The recent technological advances in radar’s signal bandwidth given the radar performance can be improved by providing better range and measurement accuracy. The radar range resolution improves the target identification and tracking capability, improving radar immunity to passive interference. Finally radar countermeasure against narrowband electromagnetic signal interferences is enhanced. Using the vast advances and advantages of MIMO in
communications and benefits of using UWB signals, this paper presents the investigation of Hybrid-MIMO radars. The simulation analysis has been carried out to demonstrate the promising features of these radars in terms of better target identification and improved transmit beampattern.

References


Index Terms

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Signal Processing
Keywords

Array processing, beamforming, beampattern design, dimensionality reduction, multiple-input multiple-output (MIMO) radar