

Abstract

Track before detect (TBD) radar is a form of radar detection that exploits the use of multiple illuminations to improve detection. This paper presents a particular form of TBD radar that is based on the Viterbi algorithm, with a sectorized target space representing state and the physically admissible transitions from one place to another based on target velocity being state transition. From this, a new algorithm is developed that exploits the coherence of backscattered power between sectors, at the cost of additional computation. Techniques to mitigate this penalty are developed as well. Simulated results are presented, showing improvement for systems with sufficiently large pulse repetition frequency.