

PERFORMANCE COMPARISON OF ALPHA-BETA-GAMMA FILTER AND KALMAN FILTER FOR TRACKING TARGETS USING RADAR MEASUREMENTS

S. M. SAHOO¹, SANDIPAN SARKAR², H. K. RATHA³ & M. M. KUBER⁴

¹STA, Integrated Test Range, Defence Research & Development Organization, Chandipur, Balasore, Odisha, India

^{2,3}Scientist, Integrated Test Range, Defence Research & Development Organization, Chandipur, Balasore, Odisha, India

⁴Scientist, R & DE (Engrs), Defence Research & Development Organization, Pune, India

ABSTRACT

Air defence application like tactical weapons system requires that maneuverable vehicles such as aircrafts, ships, submarines and missiles, be tracked accurately. This paper presents the performance comparison of α - β - γ filter & Kalman filter for tracking targets using radar measurements. Also a Linear Kalman Filter has been implemented with switching of process noise co-variance (Q) during the different phases of flight.

In this paper switching of Q has been selected by heuristic method or a-prior knowledge of the vehicles dynamics. Instead of a constant Q, switching Q technique has come out as a better solution for position and velocity estimation of maneuverable vehicles. The performance of the filter has been evaluated on the basis of Noise Reduction Ratio (NRR).

KEYWORDS: Kalman Filter (KF), Range, Azimuth, Elevation, Noise Reduction Ratio (NRR)