

Parameter	RADAR	Optics
Aperture (λ) required for 1mrad angular resolution	X-band 8–12GHz (λ ~2.50–3.75cm) ~37m Ku-band 12–18GHz (λ ~1.67–2.50cm) ~25m Ka-band 24–40GHz (λ ~0.75–1.11cm) ~11m	LWIR (λ ~8–14 μ m) ~0.030m MWIR (λ ~3–5 μ m) ~0.010m SWIR (λ ~1–2.5 μ m) ~0.005m
Receiver signal	$P_{\gamma} = \frac{\sigma \cdot R \cdot F^4}{(4\pi)^2} \frac{A_{\gamma} \cdot G_{\gamma}}{R^4}$	$P_{\gamma} = J_{\text{obs}} \frac{A_{\gamma} \cdot G_{\gamma}}{R^2 / \tau_{\text{opt}}(R)}$
Range measurement	Very accurate – pulse Time of Flight measurement	Difficult. Only by means of triangulation from multiple viewpoints, or - passive ranging with signal processing from multiple optical band.
Velocity measurement	Very accurate – Doppler effect measurement	Difficult. Only by means of triangulation from multiple viewpoints.
Weather dependency	Weak	Strong. Inoperable in dense fog and clouds.

FIG. 1

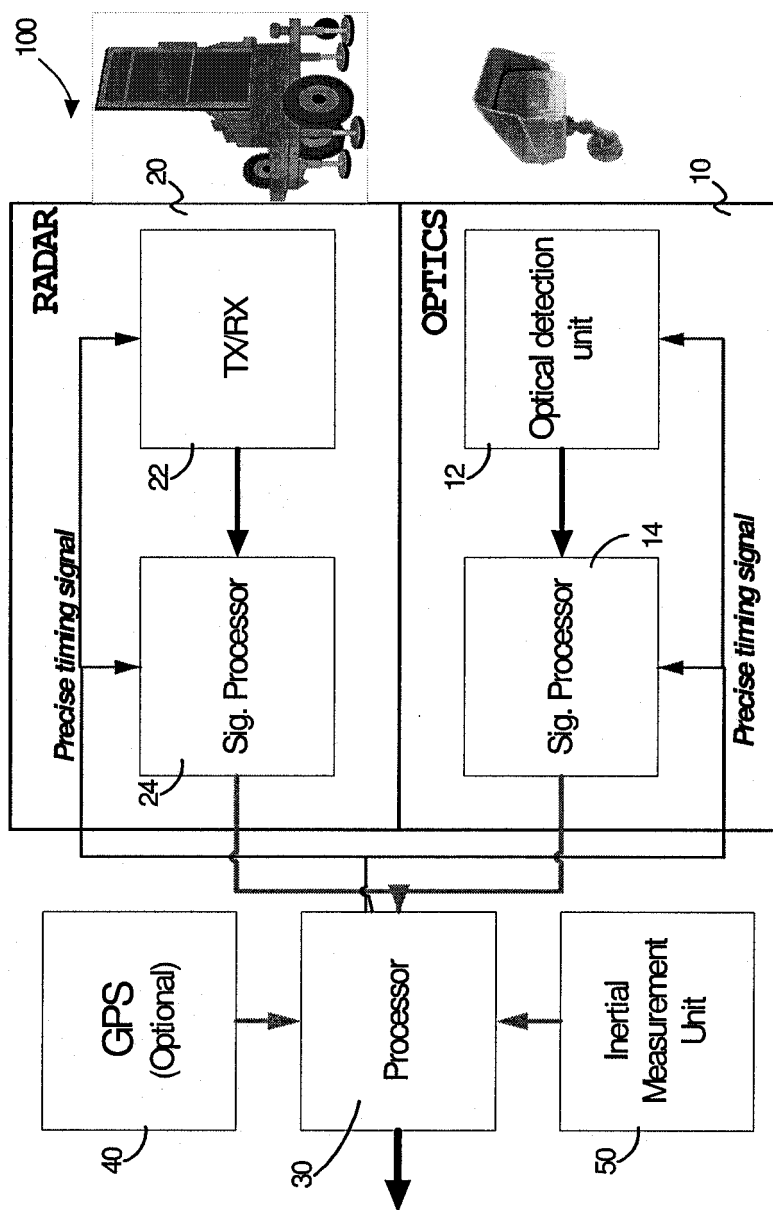


FIG. 2

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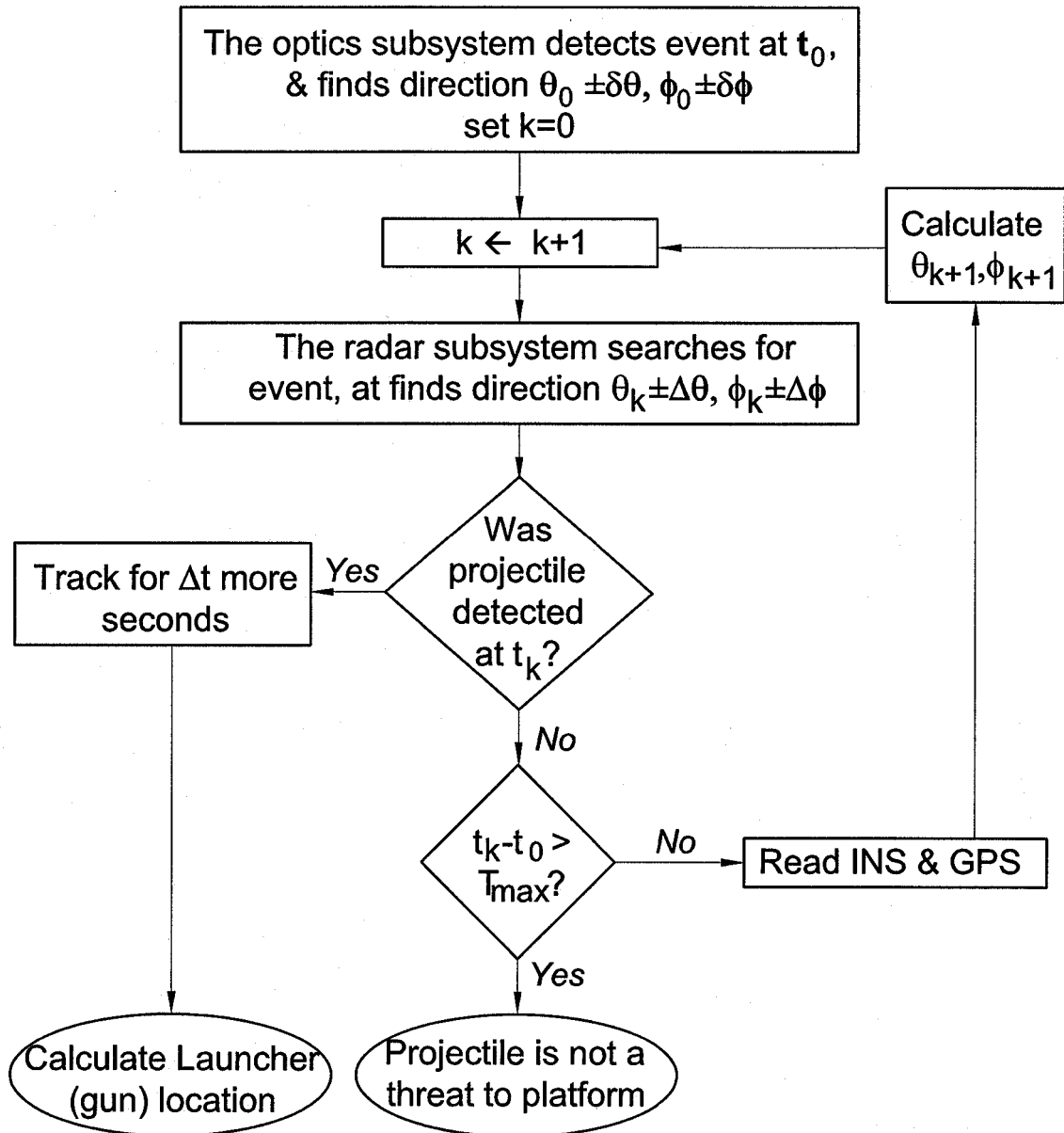


FIG. 3

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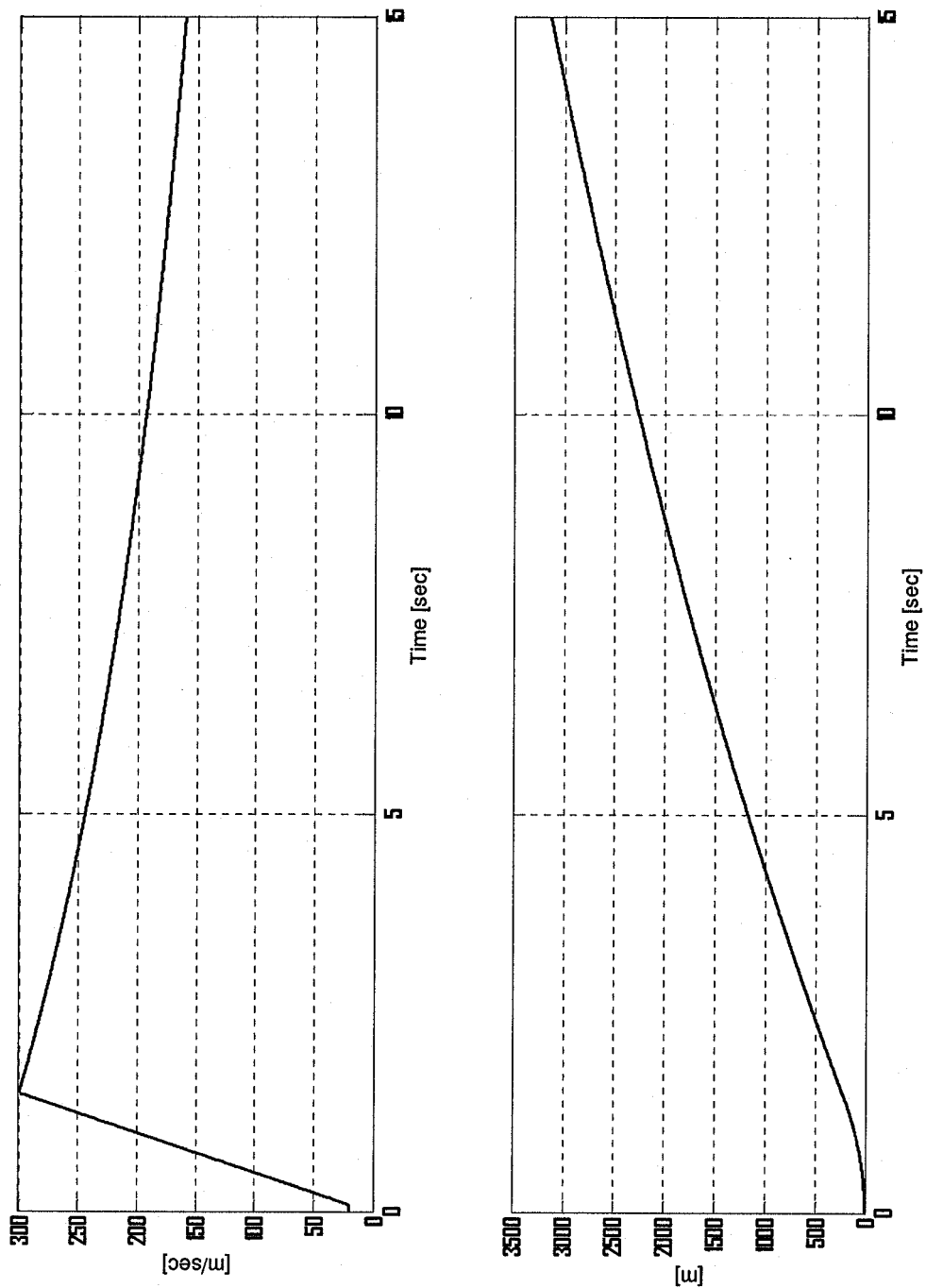


FIG. 4

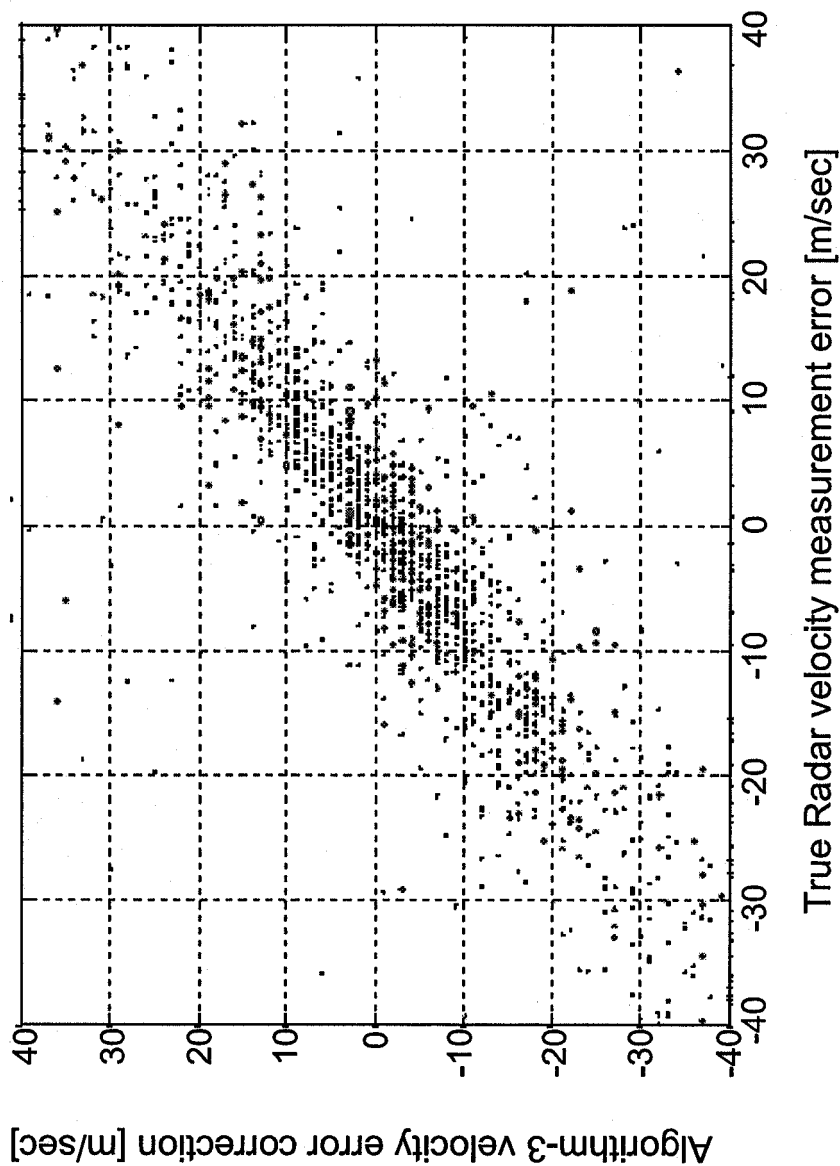


FIG. 5

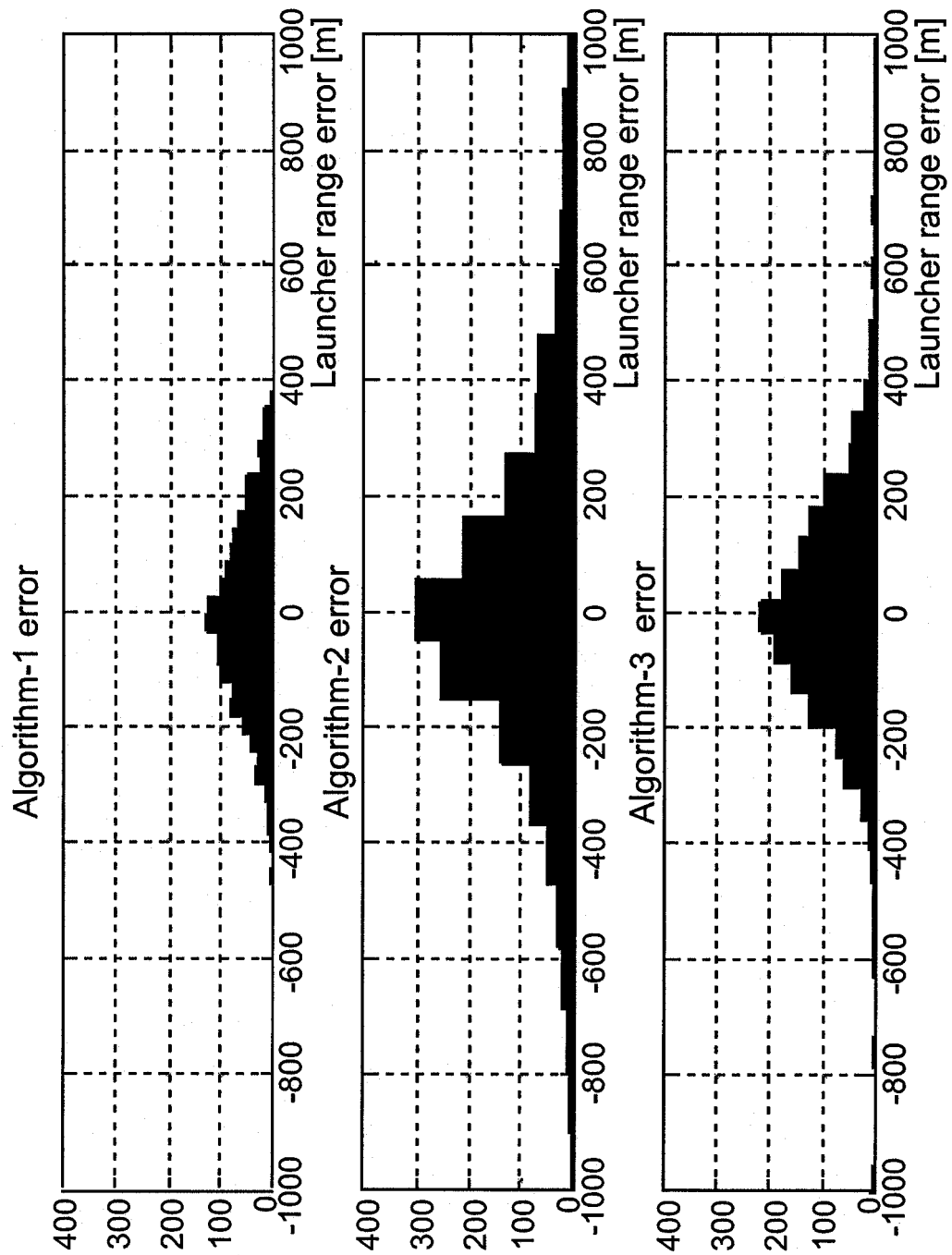


FIG. 6