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Optics and Acoustics » Optical Countermeasures

Simulations to Predict the Countermeasure Effectiveness of Using Pyrophoric Type Packets Deployed from TALD Aircraft

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Abstract: Manned aircraft that are intended for surveillance or to complete a bombing mission will very likely be engaged by surface to-air-missiles having guidance systems based on infrared (IR) technology. The objective of this study was to characterize via simulation the amount of "cover" that can be obtained by dropping from a pre-launched, unmanned tactical air launched decoy (TALD) a sequence of pyrophoric materials to create an IR cloud, analogous to the interference created by microwave **chaff**, that would protect the manned aircraft from the missile. The performance analysis is based on a simple reticle based model in which the two-dimensional (2D) image is reduced to either a composite signal, created by the aircraft, or a composite noise, created by the pyrophoric expandable. The analysis leads to a computer simulation model producing time and space dependent signal-to-noise ratios. It is demonstrated that the simulation model can answer questions such as how long the materials need to burn, how much intensity is needed, what wavelength range is most effective, which pyrophoric packets should be dropped, and how many. A visual model of the time dependent IR pyrophoric cloud has also been created.

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