Click here to view PowerPoint presentation; Press Esc to exit

Sensor Fusion for Short Range Air Defence

P.M. Keyzer
TNO – Fysisch en Elektronisch Laboratorium (FEL)
EW and Electronic Security Program
Oude Waalsdorperweg 63
2597 AK 's-Gravenhage
THE NETHERLANDS

keyzer@fel.tno.nl

C.M. Birkemark
Danish Defence Research Establishment
1 Ryvangs Allé
DK-2100 Copenhagen Ø
DENMARK

cmb@ddre.dk

The increasing refinement of modern armed forces with fast and highly manoeuvrable airborne vehicles leads to a particularly dynamic situation on the battlefield. To satisfy the extensive need for precise and timely information, all available sensor sources must be used. To overcome the existing limitations of individual single sensors, the use of multiple sensors appears reasonable and promising.

This abstract discusses the second phase of the NATO SCI-069 study on Sensor Fusion for Short Range Air Defence, a study that has assessed potential benefits of using multiple sensors, as opposed to a single sensor, for applications such as targeting and surveillance in the context of future (post 2015) SHORAD systems. The first phase focused on a qualitative assessment of the benefits of a multiple-sensor approach, while this second phase has aimed to quantify the results through simulations and through analysis of real exercise data.

An approach has been taken that involves the appreciation of the factors driving future SHORAD systems. This involves analyses based on parameters such as: scenarios, the operational environment, weapons and surveillance technology, the fundamentals of SHORAD systems and system architectures. These parameters have been aggregated through simulations and through data analysis to provide quantitative measures for the benefits of data fusion.

The analyses have demonstrated that the benefits from data fusion is strongly dependant on both scenario and target types. Improved performance is quantitatively demonstrated in several areas of direct military significance, such as target detection, tracking and identification (non-cooperative as well as cooperative) and in parameter assessment (situation, threat, weapon and kill). In some cases, capabilities are added where they are currently very limited or non-existing. In the current study it has however been impossible to assess all the different aspects of data fusion. For example do the simulations not take composite tracking into account. It is therefore recommended that further studies should focus on more detailed simulations and on target scenarios expected to stress the sensor suites.

Keyzer, P.M.; Birkemark, C.M. (2005) Sensor Fusion for Short Range Air Defence. In *Design Considerations and Technologies for Air Defence Systems* (pp. 14-1 – 14-2). Meeting Proceedings RTO-MP-SCI-143, Paper 14. Neuilly-sur-Seine, France: RTO. Available from: http://www.rto.nato.int/abstracts.asp.