Fusion Concepts for Multistatic Sonar Systems

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Abstract: Multistatic sonar operation provides some well-known advantages compared to monostatic operation like enlarged detection areas and increased probability of detection. In order to gain the maximal profit from the information of different sources highly sophisticated fusion algorithms have been developed during the last years. Furthermore, today’s processing power allows the application of modern algorithms in real time.

In the literature there are two general concepts for data fusion. One concept is the decentralised fusion, where each sensor has its own tracking system and the fusion of the data is performed on track basis. Another approach is the centralised fusion, where the contacts of all sensors are processed in a common tracker.

From the theoretical point of view the centralised fusion can provide the optimal performance concerning track stability and accuracy of the estimated target kinematics. However, in some applications the decentralised tracking is preferable, e.g. to overcome systematic measurement errors.

In this presentation evaluations of datasets recorded by two completely different sensor systems are shown. It turns out that each of these sensor systems requires its individual fusion concept.