

TSX/TDX TerraSAR-X Science Team Meeting, 17 - 20 October 2016, DLR Oberpfaffenhofen

Classification of maritime objects in TerraSAR-X imagery

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For an adequate security of the maritime domain is necessary to be aware of the objects location and their activities, e.g. ship traffic, in relevant areas of the sea. TerraSAR-X, a satellite radar imager operating at X-band, is a powerful tool to detect maritime objects, e.g. ships, oil platforms, icebergs etc., which can raise potential risk for maritime traffic and environment. The use of satellite radar to create such awareness has the benefits, among many, that can detect also no self-reporting objects; it operates almost independently of cloud cover and beyond coastal ranges. However, radar images are less easy to interpret and carry no direct objects identification information, like it happens in optical images or messaging report systems such as Automatic Identification System (AIS) and Long Range Identification and Tracking (LRIT). Therefore, the challenge is to classify the different types of maritime objects based on the radar signal only. Different machine learning techniques are here investigated to this end.