

# New Airborne SAR for Oil & Ship Detection



Switzerland

# RST – a High-Tech RADAR Company



- ✧ RST is specialized to SAR, RA, GPR
- ✧ Mostly we develop products needed, but not yet available on the market
- ✧ Our engineers were involved in the development of satellite SARs like ERS-1/2, X-SAR, and last but not least in the German SAR reconnaissance satellite constellation “SAR-Lupe”
- ✧ Our new product is an airborne SAR sensor “WSMS” optimized for surface monitoring
- ✧ We are experts on “Design to Cost” and hence WSMS is an affordable sensor with a high performance to cost ratio



# WSMS is a all weather -system for...



- ✧ observation, prevention and detection of water pollution
- ✧ recognition of potential polluters (ship-detection)
- ✧ enabling a more economic observation of huge sea areas and shipping routes (possible 16,000 qm<sup>2</sup> pro hour)
- ✧ Monitoring of ship movements in coastal regions
- ✧ Sea border control and coastal monitoring also to fight against illegal immigration and smuggle
- ✧ Land border control by using the 40km width sight
- ✧ Disaster-management
- ✧ One mission can have more than one client:  
police, military, border control and customs.

# Advantages of RST's SAR



- ✧ Oil detection spatial resolution: 30m x 30m  
*(other oil detection SLAR sensors: 70 m x 50 – 300m)*
- ✧ Ship detection spatial resolution: 5m x 5m  
*(other oil detection SLAR sensors: not existing)*
- ✧ WSMS antenna length: 72 cm  
*(other oil detection SLAR sensors: 4 m)*
- ✧ RF output power: 80 W  
*(other oil detection SLAR sensors: 25 KW)*
- ✧ Integration into smaller aircrafts possible, low TCO and mission-costs
- ✧ No risk/danger for pilots, operators and other people
- ✧ ITA free system

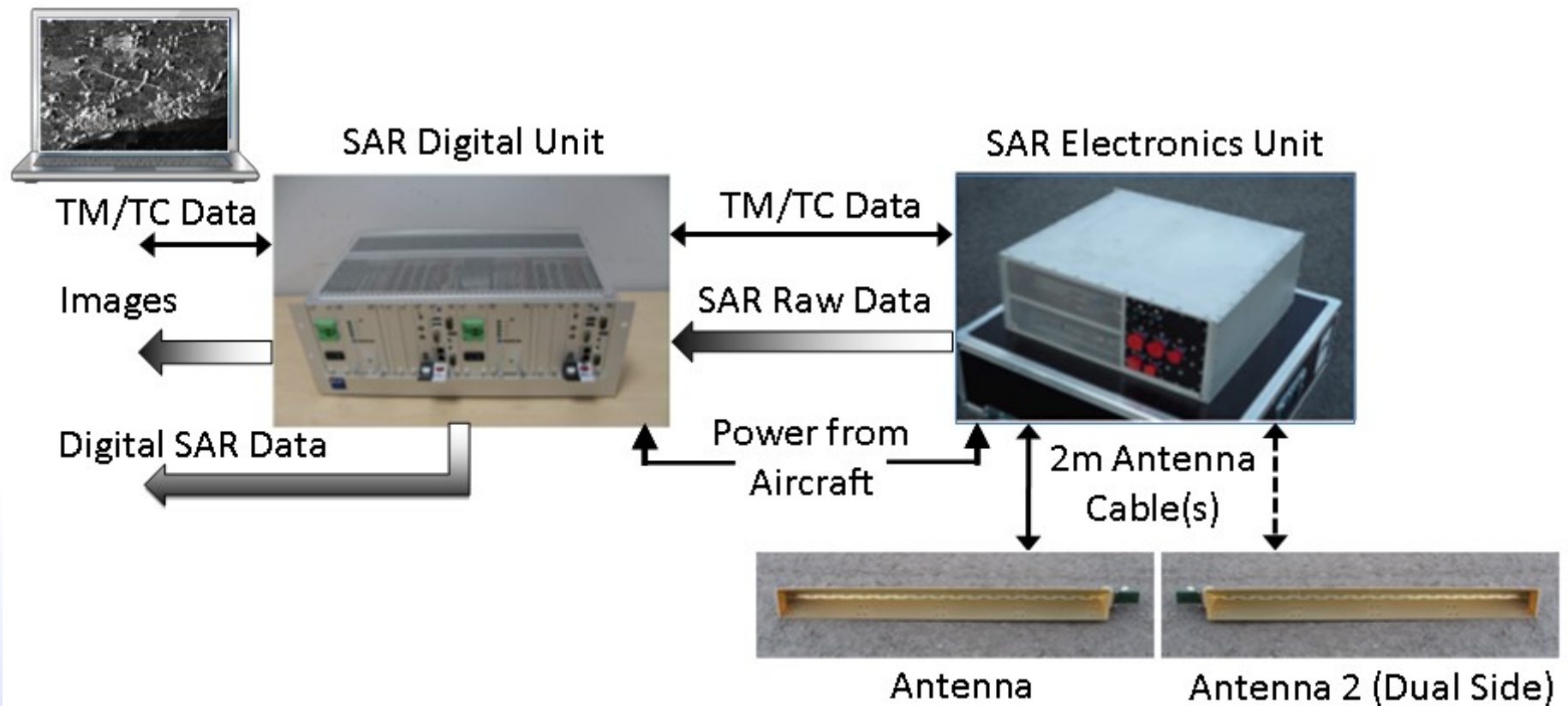
# Further system characteristics



- ✧ Nominal flight altitude: 300m – 3km (higher altitudes possible with slight degradations of SNR)
- ✧ Radar Frequency: X-band
- ✧ Operation during day & night, through clouds, fog, rain
- ✧ Swath width 2 x 40km (two sides operation)
- ✧ Onboard real-time SAR Processing
- ✧ Image delivery in 3s intervals
- ✧ at Ground station refined picture processing is possible



# Configuration fast version



Side version

- ✧ Delivery time is 6 months after order or export licence
- ✧ Certification under customer responsibility

# Possible radar platforms



# Configuration slow version



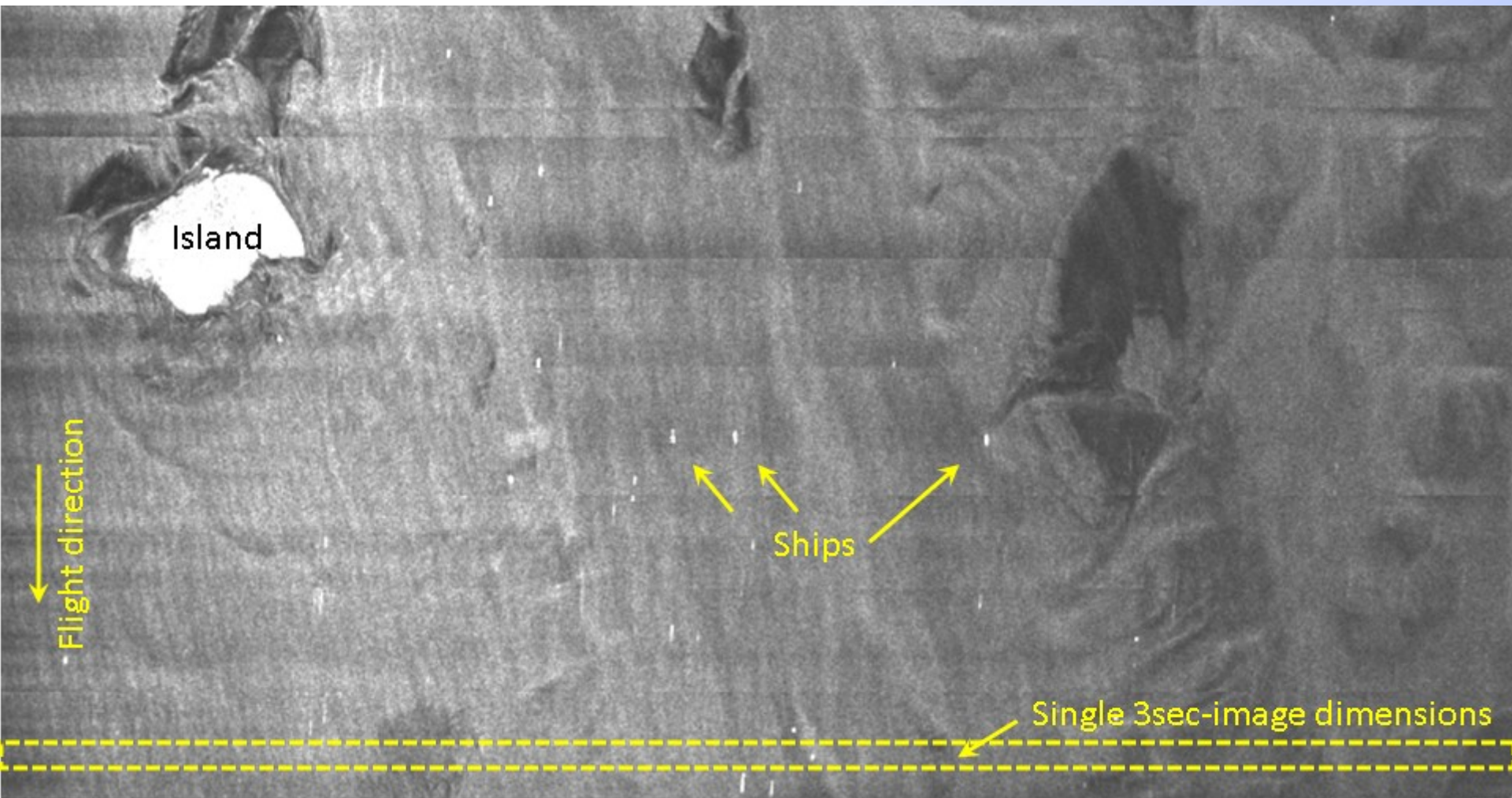


# Configuration data



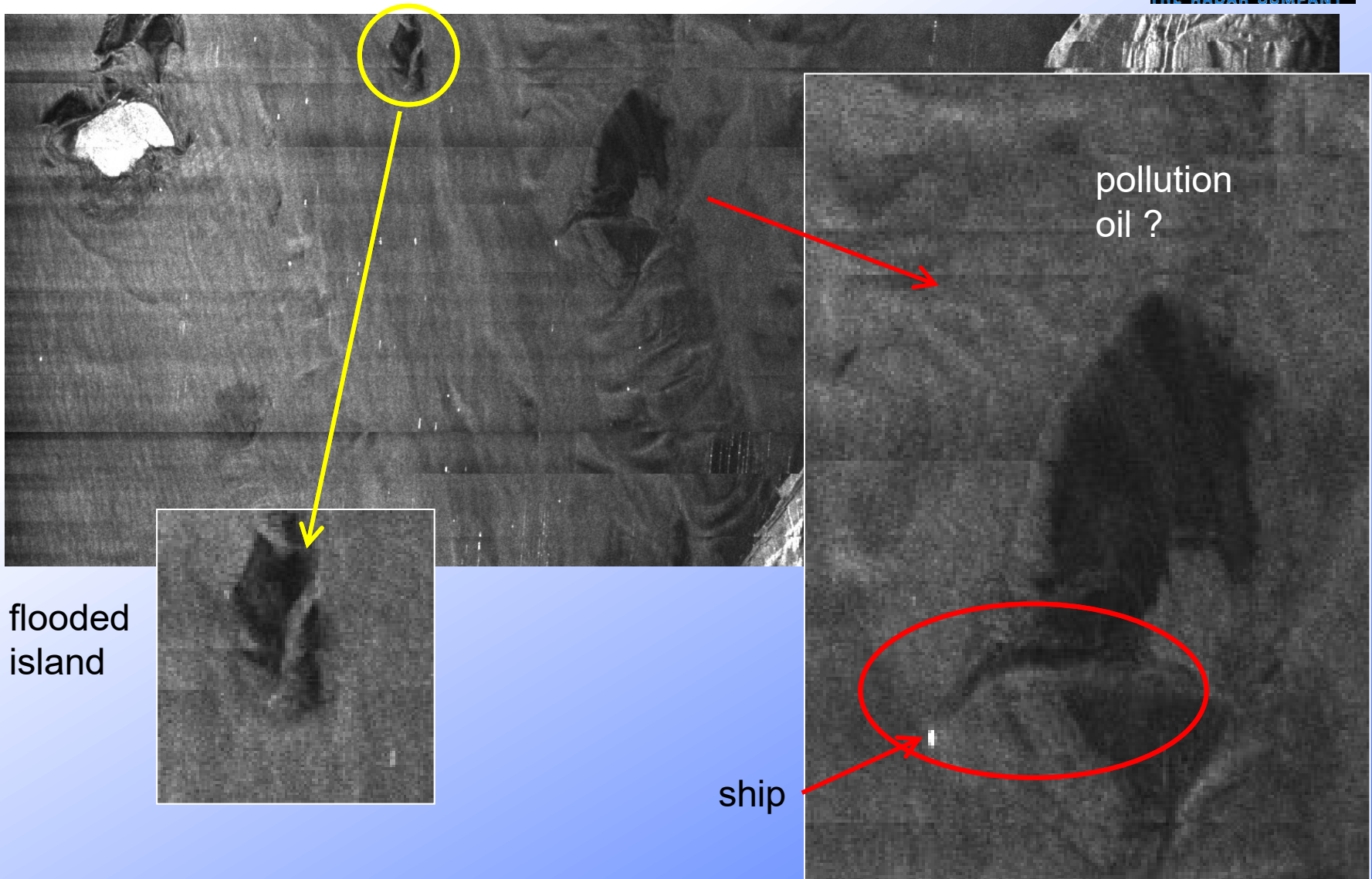
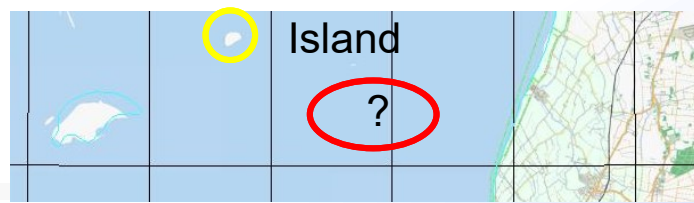
- ✧ SAR Electronics Unit
  - Volume: W 19" / H 4HE / D 420mm
  - Mass:  $\leq 15\text{kg}$
- ✧ Onboard Computer
  - Volume: W 19" / H 5HE / D 420mm
  - Mass:  $\leq 15\text{kg}$
- ✧ Image data rates to Console
  - ODM: 0.2 MBite/s
  - SDM: 1.8 MBite/s
- ✧ Antenna (each)
  - Dimensions: 72 x 6 x 7 cm<sup>3</sup>
  - Mass:  $\leq 5\text{kg}$
- ✧ RF Cables between SEU & ANT: 2m length max.
- ✧ Power from Aircraft:  $\leq 300\text{ W}$  (28 VDC)
- ✧ IMU/GPS: APPLANIX recommended

# Image example Oil Detection Mode



✧ Ocean surface wave structures are clearly visible

# What is pollution?





# Single Look Image

Single Look SAR Images can be used to

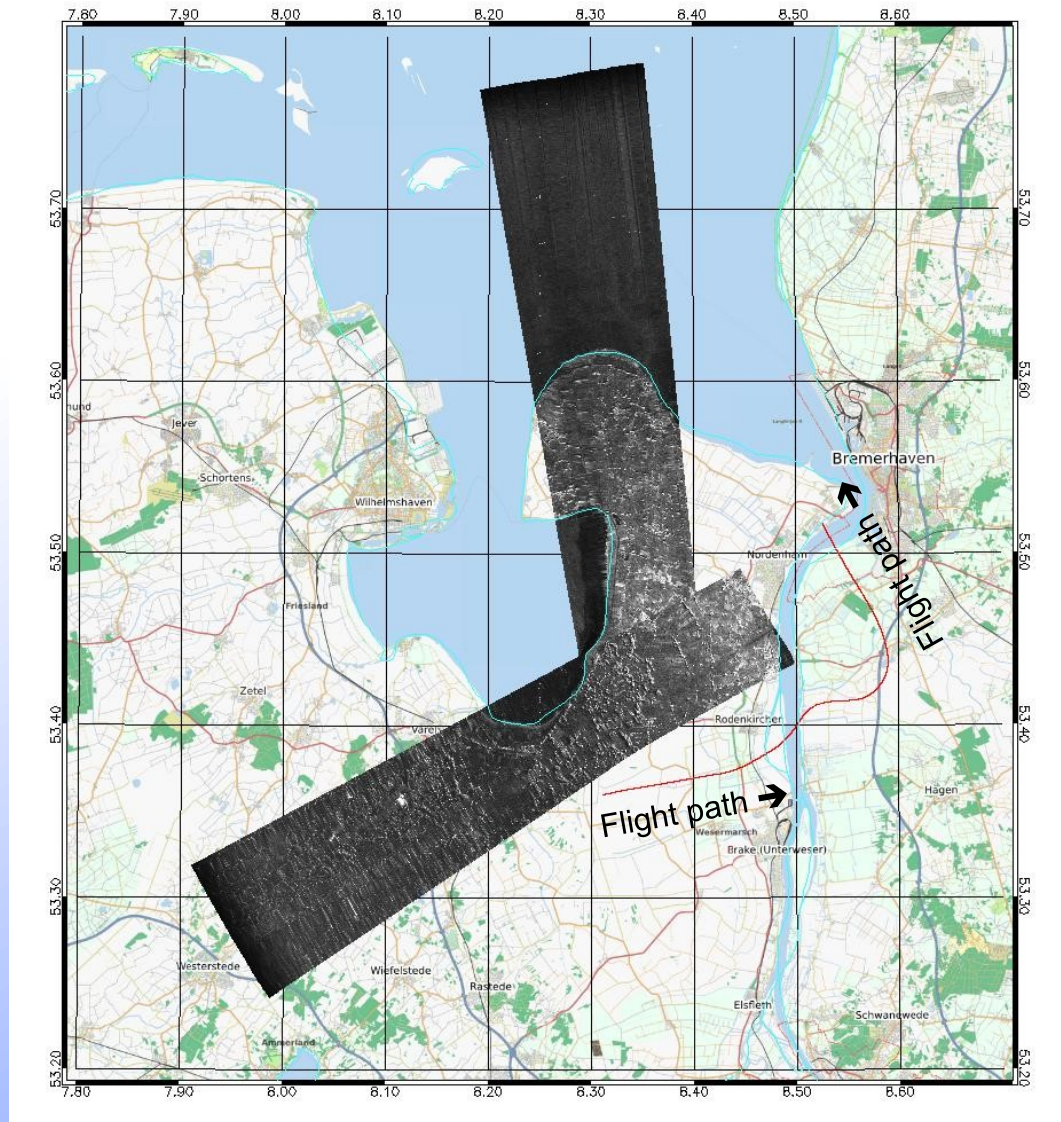
- detect ships and identify ship classes by size
- detect oil spills
- Situation analysis after disasters
- Control borders to prevent smuggle and illegal immigration
- Mapping of Landscapes



Weser River, North Germany  
Ships can clearly be identified  
Harbor structure is well visible



# 2 SDM images geo-referenced



- ✧ RST's WSMS is an airborne SAR sensor focused to
  - medium resolution monitoring purposes
  - Sea surface pollution detection, Ship detection
  - Ground monitoring
- ✧ It can be integrated into small airplanes and UAV/UAS
- ✧ Implementation in existing aircrafts as well as complete special mission aircrafts can be delivered (with a partner)
- ✧ It is a cost effective Radar sensor
- ✧ Upgrades under investigation:
  - Single-Look resolution of 2.5m
  - Interferometric SAR for Topographic surface Models generation
  - SAR-MTI Configuration

Thank you for your interest



German & Swiss technology and quality  
for worldwide users

your RST team