

# Wavemill Proof-of-Concept Flight Trials



- Prime and instrument provider
- Campaign execution and management



- SAR and Interferometric Processing
- Retrieval of Geophysical Information



- Ground truth and scientific assessment



- Customer/Sponsor

## Objectives:

- Demonstrate the feasibility of the Wavemill Concept
- Obtain a better understanding of the products that could be derived from a Wavemill instrument

## Instrument Features:

- Interferometric Synthetic Aperture Radar (inSAR) Spaceborne System.
- Two-side-looking mono-static and bi-static system at Ku-Band (13 GHz).

## Primary Objectives:

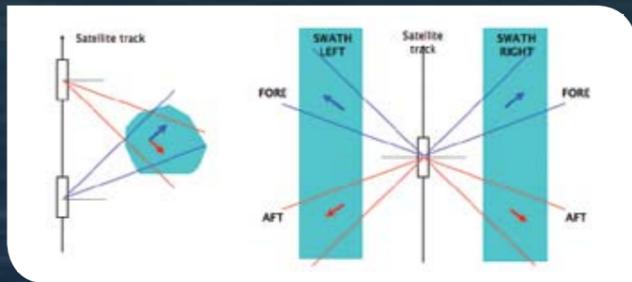
- Measurement of 2D sea surface= currents (velocity and direction).
- Wide Swath coverage (200 km).
- Coverage of Coasts and Open Ocean.
- Continuous operation (over oceans).

## Secondary Objectives:

- Measurement of sea surface height.
- Scatterometry

## 2D sea Current Observations

- Radar observations made along the instrument line-of-sight.
- Ideally, two orthogonal observations are required to obtain sea surface movement direction.
- Observations must be made in short time to avoid temporal decorrelation.
- Solution: squinted observations.



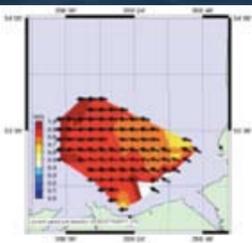
## Radar Instrument

- Astrium Airborne demonstrator
  - Left looking
  - $f_0 = 9.55$  GHz. BW= 100 MHz
  - Tx Power= 100 W. Pulse length= 14 us. PRF= 5664 Hz (per channel)
  - Vertical Polarization
  - Look angle:  $16.8^\circ - 33.8^\circ$ . Boresight squint angle:  $21.9^\circ$
  - height = 2800 m
- Instrument flown on a DC-3 fitted with an under belly radome capable to accommodate the antenna arrangements
- Antennas mounted on stabilized gimbal (yaw and roll)



## Test Site: Liverpool Bay, UK

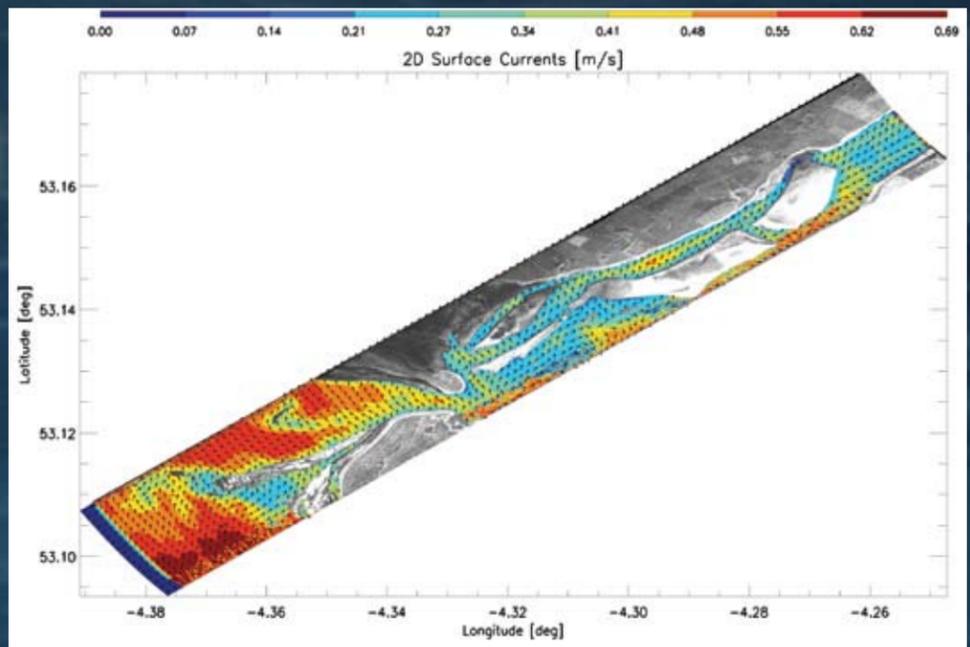
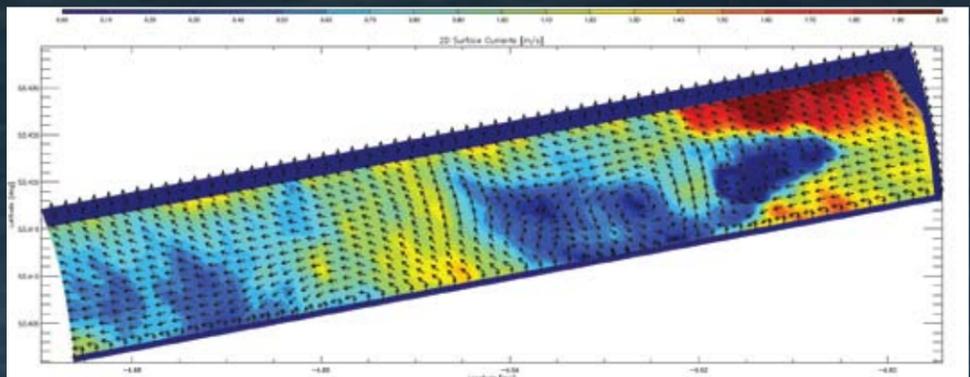
- Semi-diurnal tidal currents dominate the dynamics of Liverpool Bay
- Currents are rectilinear, flowing eastward on the flood and westward on the ebb
- Trials on the 26th and 27th October 2011 being the tide on ebb
- Liverpool Bay is monitored, providing ground truth data



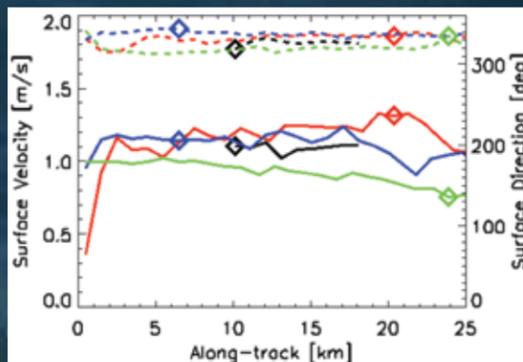
## Menai Strait Amplitude Images



## Surface current - Anglesey North & Menai Straits



## Surface current results - Liverpool Bay



All the space you need

