# High-level SAR data processing (InSAR,CCD) using Ku-band airborne SAR system

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# 0. Outline



1. Introduction
2. Interferometric SAR
3. Coherent Change Detection
4. Summary

**2005–2006**

**30cm Ku-SAR system**

**2007**

**50cm$^3$ accuracy DSM InSAR**

IGARSS 2007 Okada. et.al.

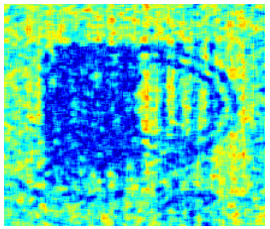
**2008**

**10cm Ku-SAR system**

**2009**

**CCD experiment**

IGARSS 2009
This presentation

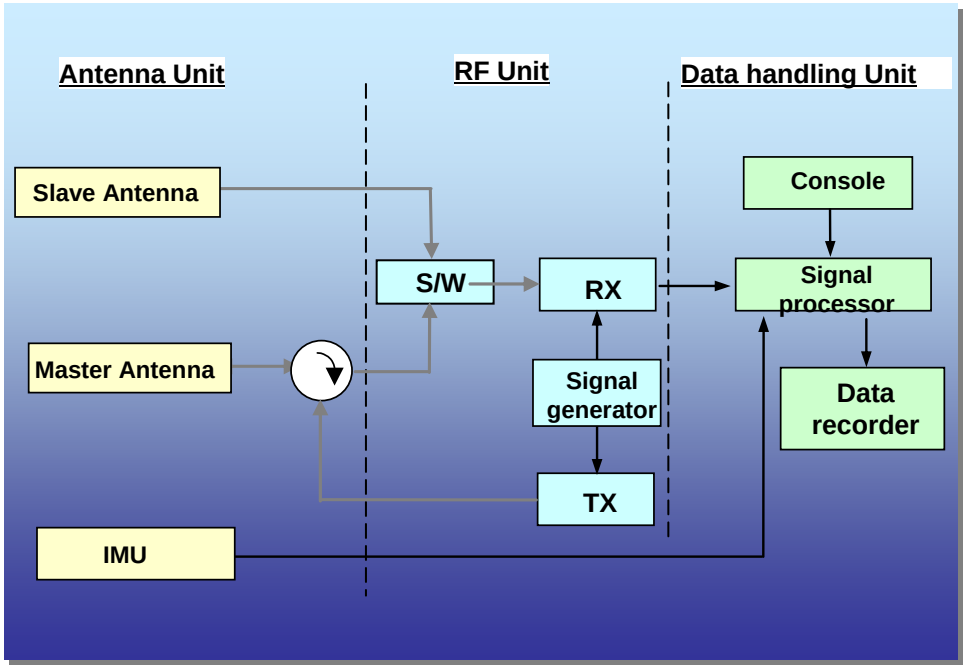


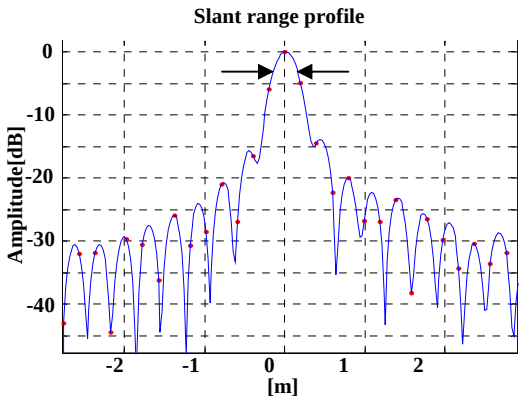
IGARSS 2009 Okada. et.al.

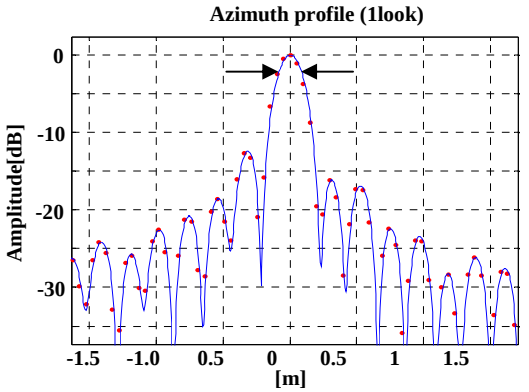
# 2. Interferometric SAR

## Ku-band Airborne SAR System


Cessna 208(Honda Airways Co.)



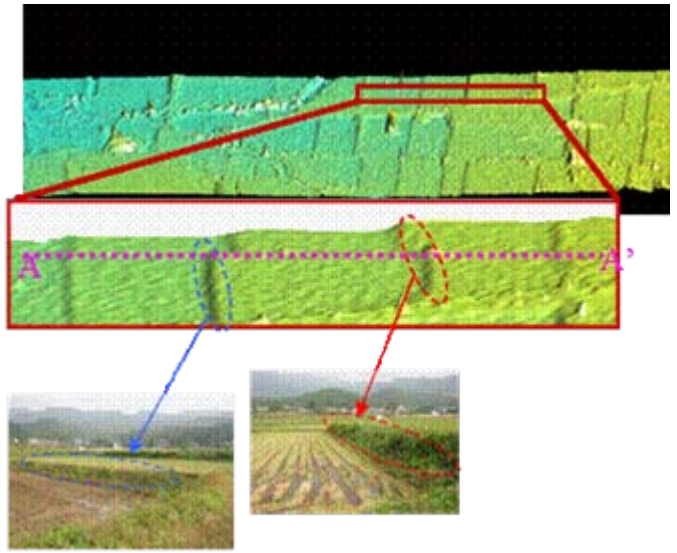






More details are described in Okada et. al. , IGARSS2007 proceedings

## Results : DSM evaluation in agricultural field




Ground truth

## Summary on Interferometric SAR

In order to develop highly accurate DSM for National Spatial Data Infrastructure,
Ku-band InSAR system was developed, and new phase unwrapping (ICM-MCF) algorithm is proposed, and applied it to the Ku-band field data.

As a result, a height accuracy (less than sub meter) mesh can be achieved.

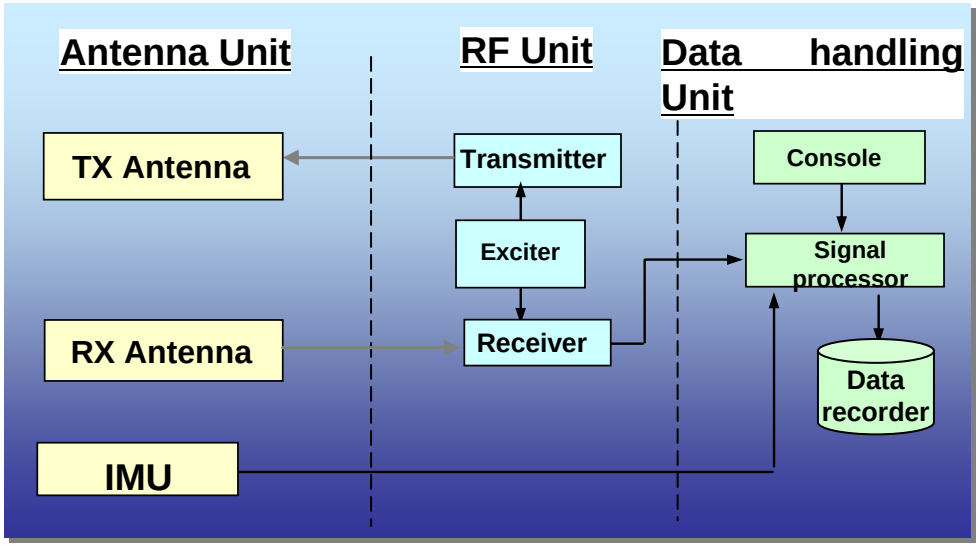
Ku-InSAR may become one of the promising instrument for future accurate 3-dimentional mapping projects.

## H/W design of 10cm SAR system

To obtain High resolution CCD map, 10cm SAR system has developed.

Platform

Gurfstream II (Diamond Air Service)

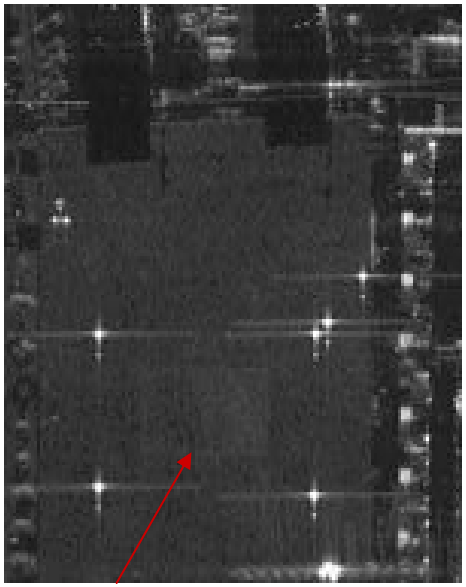


# 3. Coherent Change Detection

## CCD experiment

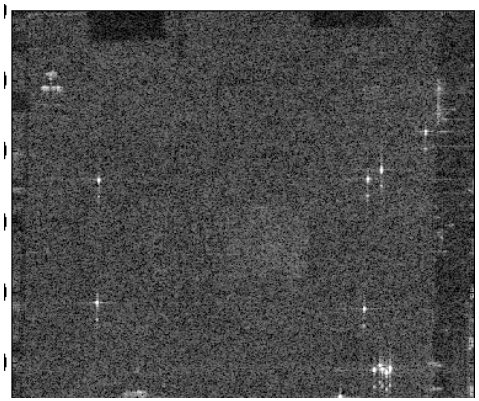
Field test configuration

SAR image



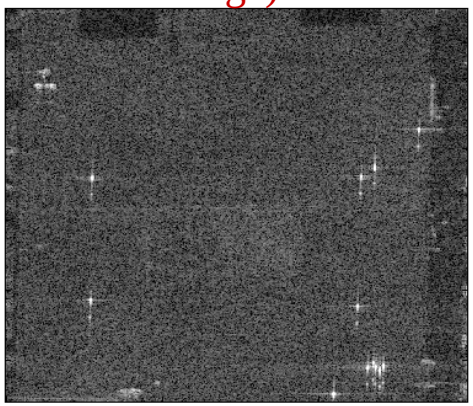
## Results

SAR image (pass-1)



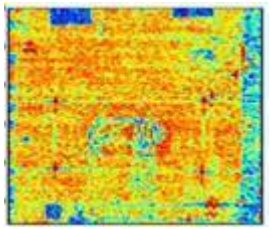
Enable to detect the change in amplitude image

SAR image (pass-2)
(after the change)



CCD process

Coherence map



## Summary on Coherent Change Detection

•To extract the very slight change, we have developed high frequency (Ku) and high resolution(10cm) airborne SAR system

•To improve coherence in airborne repeat pass observation, we have developed repeat pass airborne navigation system

•We have successfully extracted high coherence value in all observations including the change in different days