
Application of ALOS data to snow cover monitoring

Asia Air Survey Co.,Ltd.

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What is AAS?

Asia Air Survey was established in 1949
as the first aerial survey firm in Japan
with its own production facilities and aircraft.

ASIA AIR SURVEY THE COMPANY

Consulting Service — survey
 — mapping
 — engineering consulting

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Remote Sensing of AAS

First — using aerial photograph

- Photogrammetry

- Mapping - analog map digital map

- Photointerpretation

 - photo reading

 - photo analysis

 - photo interpretation

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Remote Sensing of AAS Cont'd

Second - Using Satellite data and GIS

Geographic information processing services including the preparation, analysis, and management of map-based digital data are essential to the timely and accurate execution of engineering-related consulting.

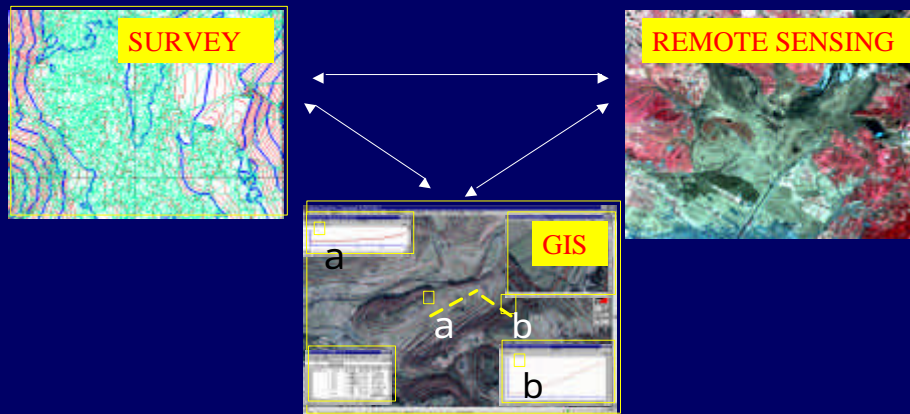
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Remote Sensing of AAS Cont'd

Third(now) - Geoinformatics

Image data + GIS + Laser profiler data ···



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Why Snow cover monitoring by ALOS ?

- Snow cover monitoring is important for water resources management, disaster prevention, leisure and so on.
- Satellite image data is useful for snow cover monitoring, but most of managers or users don't use satellite data, because they cannot get data just when they want data.

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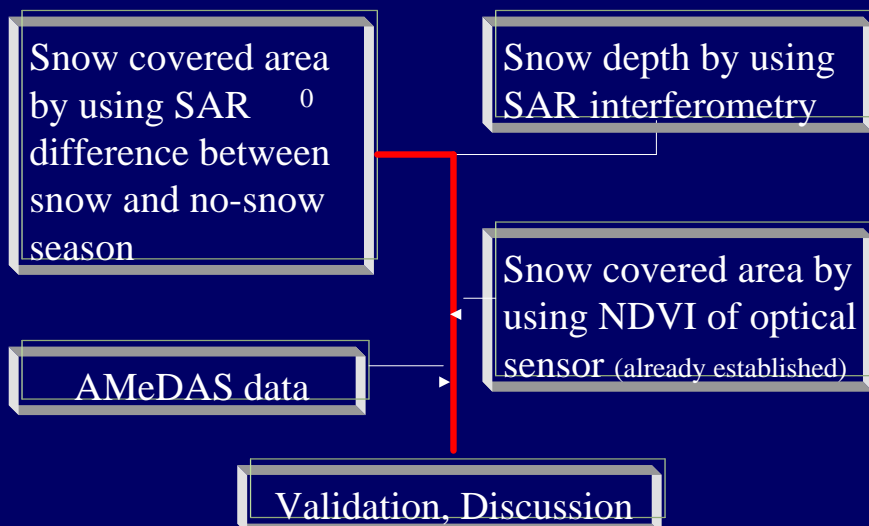
Why Snow by ALOS ? Cont'd

- ALOS has 2 optical sensor and SAR.
- ALOS can acquire data for same point every 2 days (sub cycle).
- SAR can acquire image in all weather conditions.
- They can get data just when they want.

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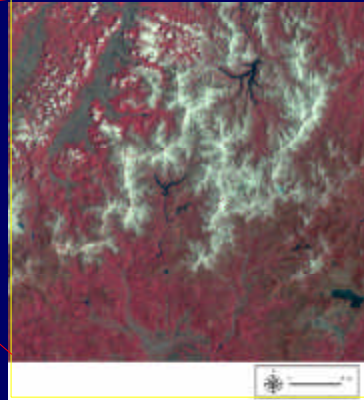
Outline of this application development



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Test area – Around Yagisawa dam basin –

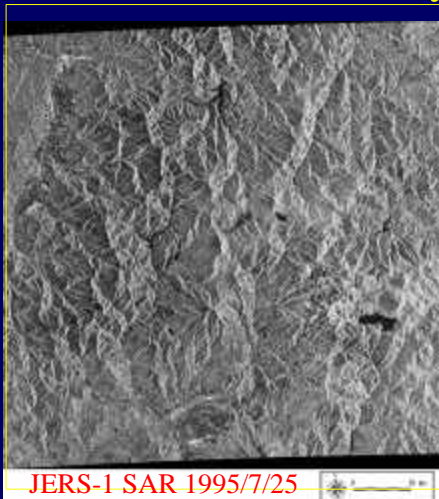


- Heavy snow
- Supply water to Tokyo area
- Many Skiing ground

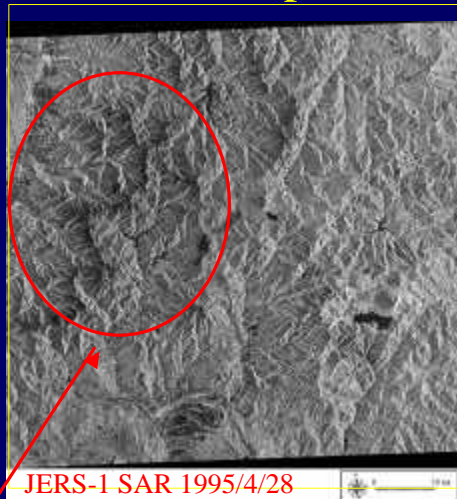
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Snow covered area by SAR – Principle –



JERS-1 SAR 1995/7/25



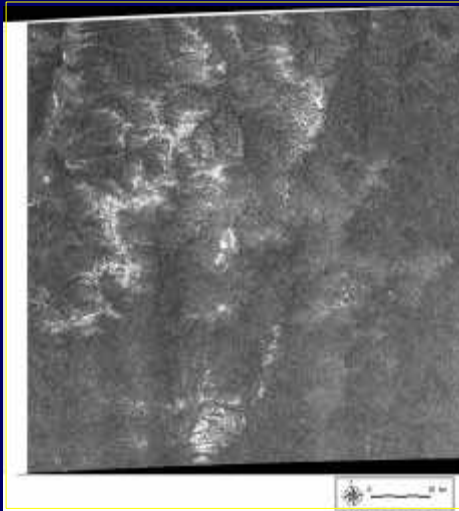
JERS-1 SAR 1995/4/28

Low DN in snow covered area

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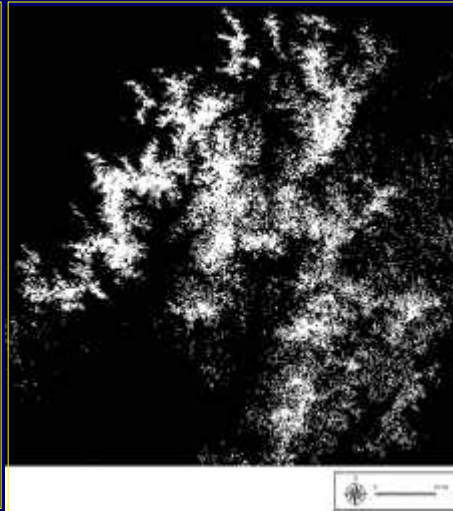
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Snow covered area by SAR – Results –



DN [95/7/25]/ DN [95/4/28]

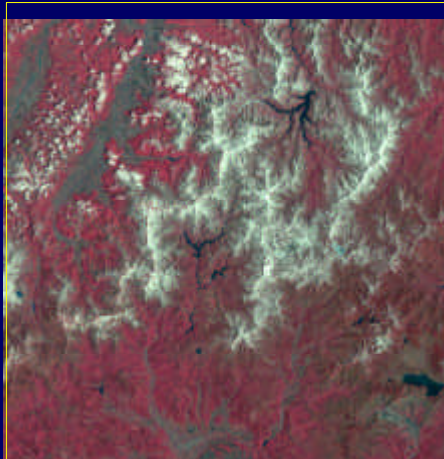
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Snow covered area image

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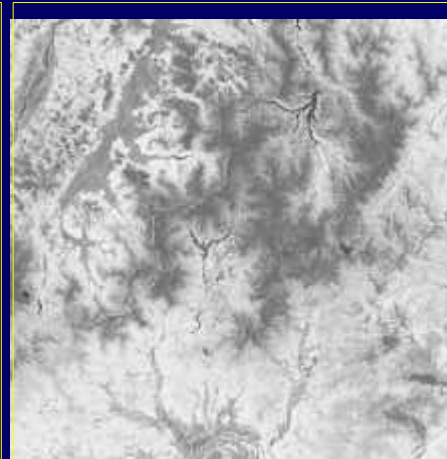
Snow covered area by optical sensor



LANDSAT TM 1995/5/18

False color image (TM)

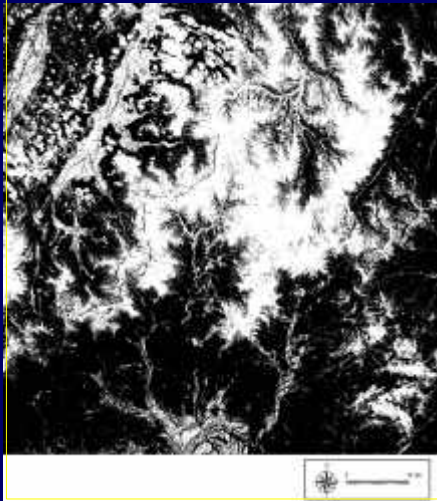
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NDVI image

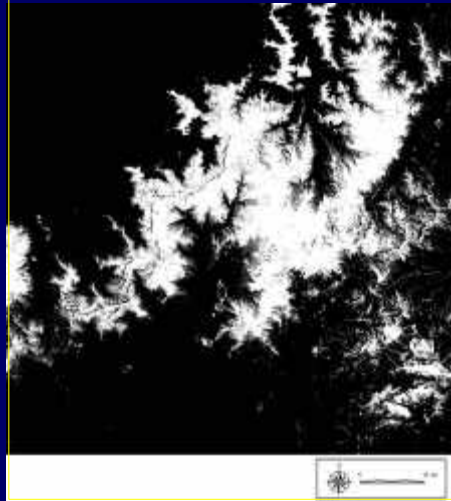
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Snow covered area using optical sensor



before correction

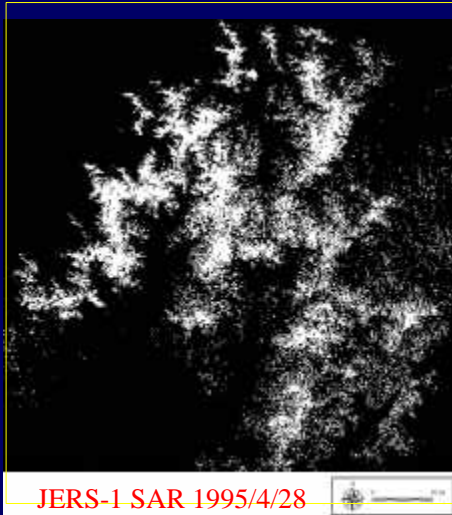
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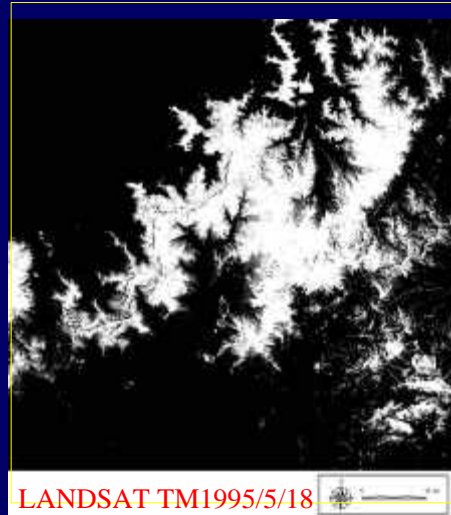
after correction

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Snow covered area validation by cross check



JERS-1 SAR 1995/4/28



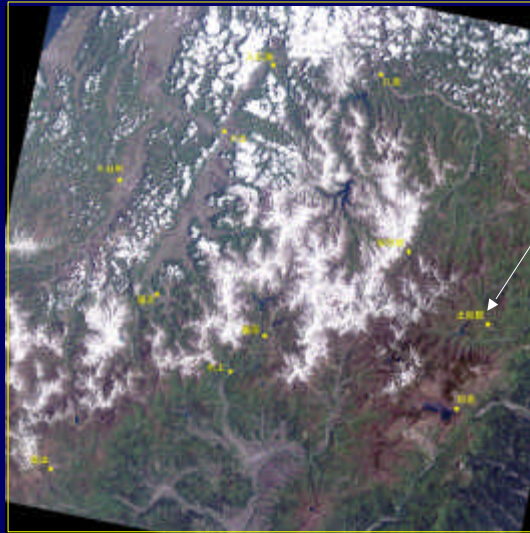
LANDSAT TM1995/5/18

Similar to each other

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Snow covered area validation by AMeDAS



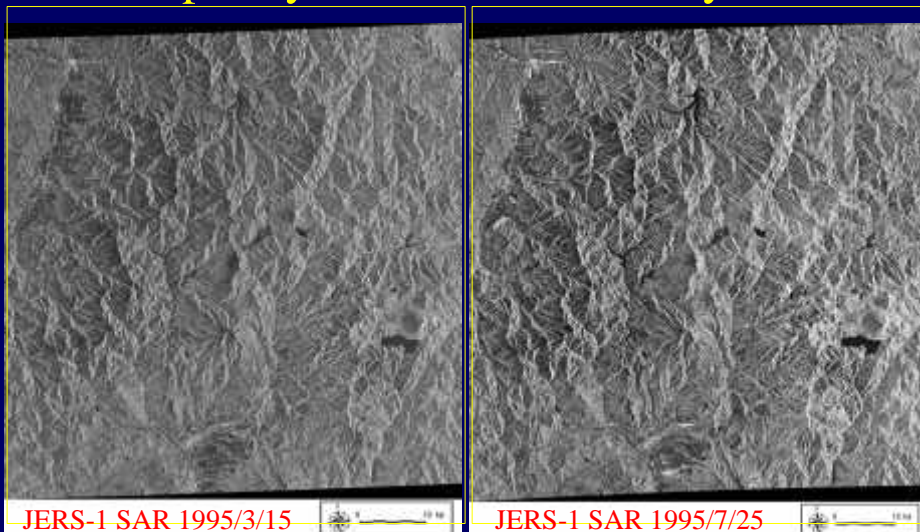
AMeDAS points

- All AMeDAS data agree with results of SAR and optical sensor.
- Now checking for other data ••

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Snow depth by SAR interferometry



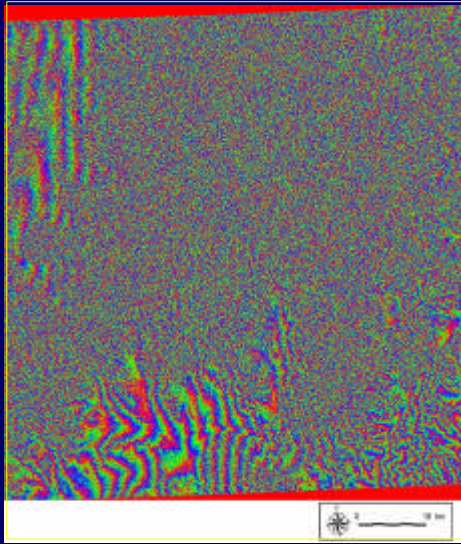
Master image

Slave image

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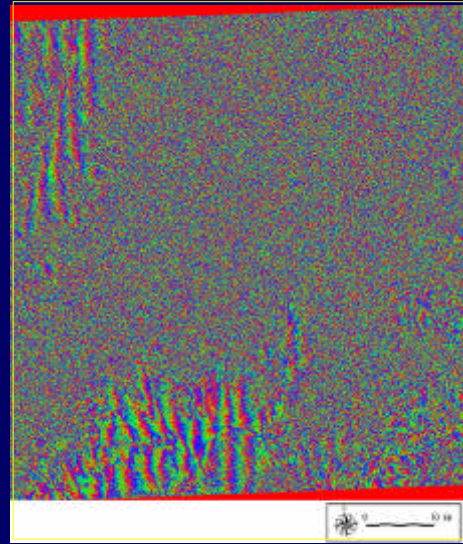
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Snow depth by INSAR – Results –



Initial interferogram

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Differential interferogram

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Snow depth by INSAR – Subjects –

Sensor

- Base line
 - Orbital information error
 - S/N ratio
- } to be improved by ALOS

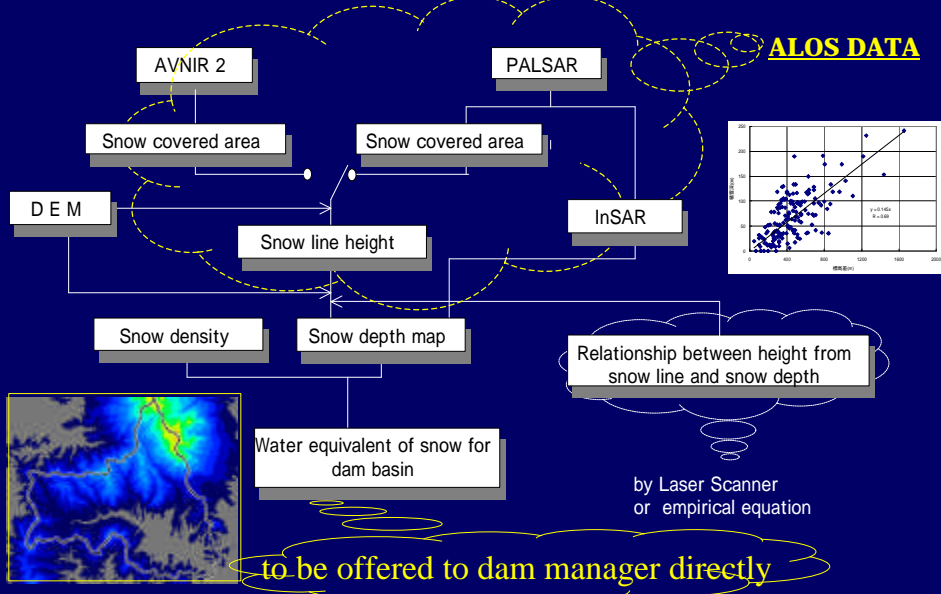
Physical conditions

- Mixture of volume scattering and surface scattering
- Land cover difference

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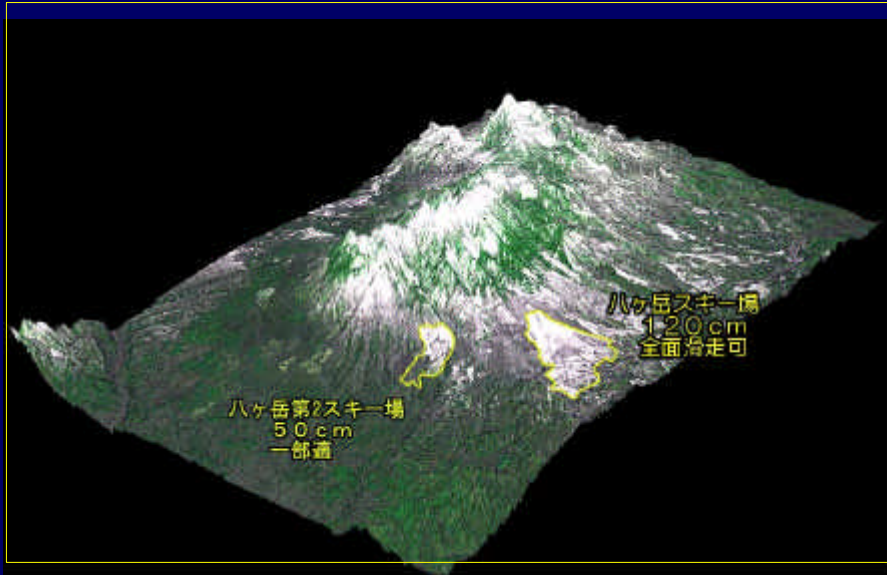
Flow chart of snow cover monitoring by ALOS



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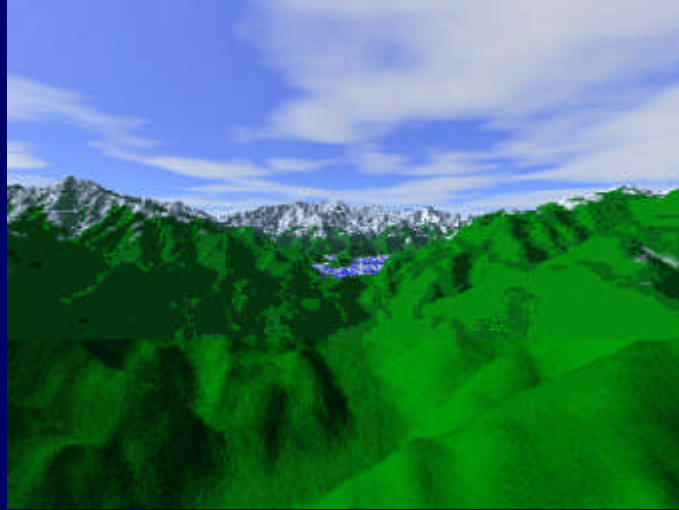
Sample image of snow info to general users



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