



DEM/DTM is a digital model or 3D representation of a terrain's surface. It may be represented as Grid data which includes raster format, interpolated values and have large storage for network analysis or in TIN (Triangulated irregular network) data which includes-

- irregularly distributed nodes and lines with three dimensional coordinates (x, y, and z)
- arranged in a network of non overlapping triangles (triangular tessellation)
- Based on Delaunay triangulation
- Density of points \propto variation in surface heights
- (+) points provide accurate representation of terrain
- (+) fewer points are needed
- (-) less suited for analysis of surface slope, aspect and network analysis.

ALOS World 3D

The Japan Aerospace Exploration Agency (JAXA) has started to process the precise global digital 3D map using some 3 million data images acquired by the Panchromatic Remote sensing Instrument for Stereo Mapping (PRISM) on-board the Advanced Land Observing Satellite "DAICHI" (ALOS), which will be useful in mapping, damage prediction of natural disaster, water resource research etc.

The digital 3D map consists of a DEM (or DSM) and ortho-rectified images (ORI) that indicate geolocation.



Specification of “ALOS World 3D” Product

- Area: Global land area within 82 deg. of N/S latitudes.
- Horizontal spacing: 0.15 arcsec (approx. 5 m).
- Management: 1 deg. tile of latitude/longitude, approx. 22,000 tiles in total.

Precise DSM Dataset

- DSM file (DSM): 5 m (RMSE) in height accuracy.
- Mask file (MSK).
- Stack number file (STK).
- Header information (HDR).
- Scene list (LST).
- Quality assurance information (QAI).

ORI Dataset

- Ortho rectified image of PRISM nadir-looking.
- Horizontal spacing: 0.075arcsec (approx. 2.5 m).
- Management: Individual scene unit.
- Ortho rectified image for nadir (ORI): 5 m (RMSE) in geolocation accuracy.
- Header information (OHR).

Correlation Coefficient Image (CCI)*

- The averaged correlation coefficient distribution image of available stereo pairs in scene-bases.
- Definition: The index shows image matching quality e.g. a correlation coefficient for the aerial correlation matching.

Comparison with other DEM

	Grid Spacing	Data	Area Source
SRTM-3 DEM	90m	N60~S56	IfSAR fromSTS-99
ASTER-GDEM	30m	N83~S83	Satellite Stereo Triangulation
PRISM-DSM	5m	PRISM data areas except for clouds	Satellite Stereo Triangulation
LiDAR-DSM	1m	N/A	Airborne LiDAR

Figure 1 Shows the resolution of SRTM and ALOS World 3D. All the features are more visible and distinguishable in ALOS World 3D.

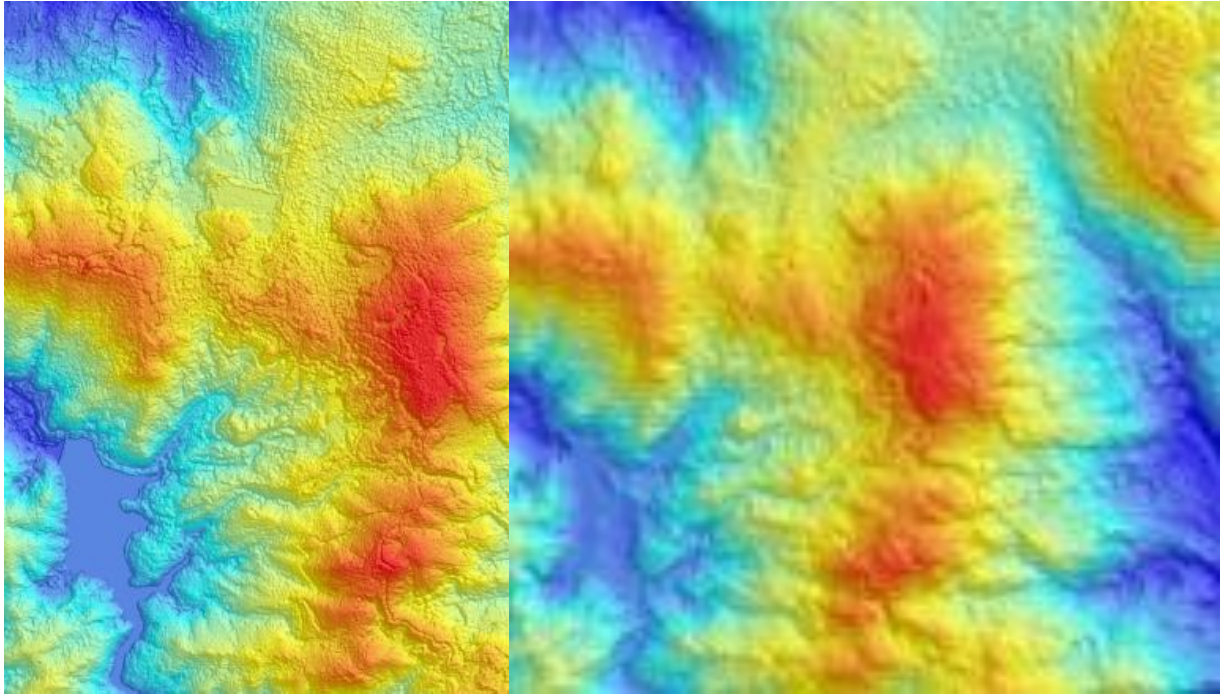


Fig. 1, shows ALOS World 3D (left) and SRTM data (right)