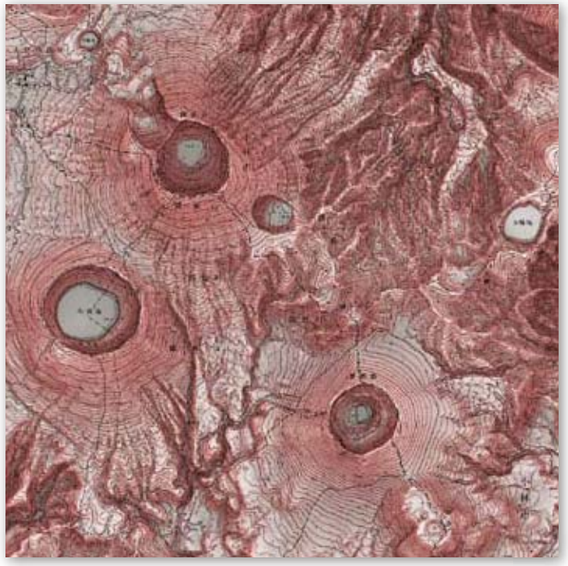
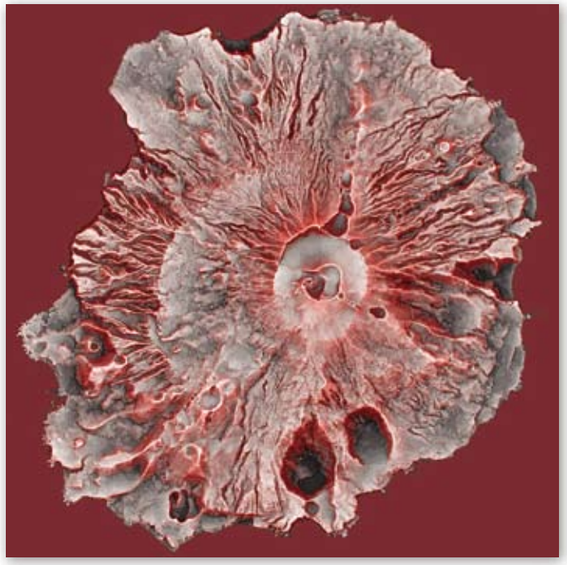
Red Relief Image Map is made from DEM data of any scale



■ **Kirishima volcano**
10m DEM data of Geographical Survey Institute Japan overlaid with topographic map.



■ **Miyake-island**[3)]
10m DEM data of Geographical Survey Institute Japan before 2000 eruption.

Red Relief Image Map will be used for various areas such as metropolitan area

■ **Shinjuku station in Tokyo**
1.5m DSM data of LiDAR.

1) Chiba,T. and Koyama, M.(2002) "The micro morotopography of Aokigahara lava flow",FUJIAZAMI, Vol.38, pp1-2.
2) Chiba,T.(2003) Preprint of Japan Geoscience Union,CD,V055-P014.
3) Synthesized from grayscale images based on Yokoyama,T.et.,al.(2000) http://www2.remos.iwate-u.ac.jp/~sirasawa/miyake/
4) DSM:Digital Surface Model,DEM:Digital Elevation Model

Other applications of Red Relief Image Map

- Management for river, road, slope failure and etc.
- Fault dynamics monitoring
- Map for outdoor recreation

etc

ASIA AIR SURVEY CO.,LTD.

Shinjuku Green Tower Bldg,6-14-1,Nishi-shinjuku,
Shinjuku-ku,Tokyo 160-0023 Japan
tel : +81-3-3348-2281 fax : +81-3-3348-2231
URL : http://www.ajiko.co.jp/
E-mail : service@ajiko.co.jp

Unveil true topography

New topography visualization method of Asia Air Survey

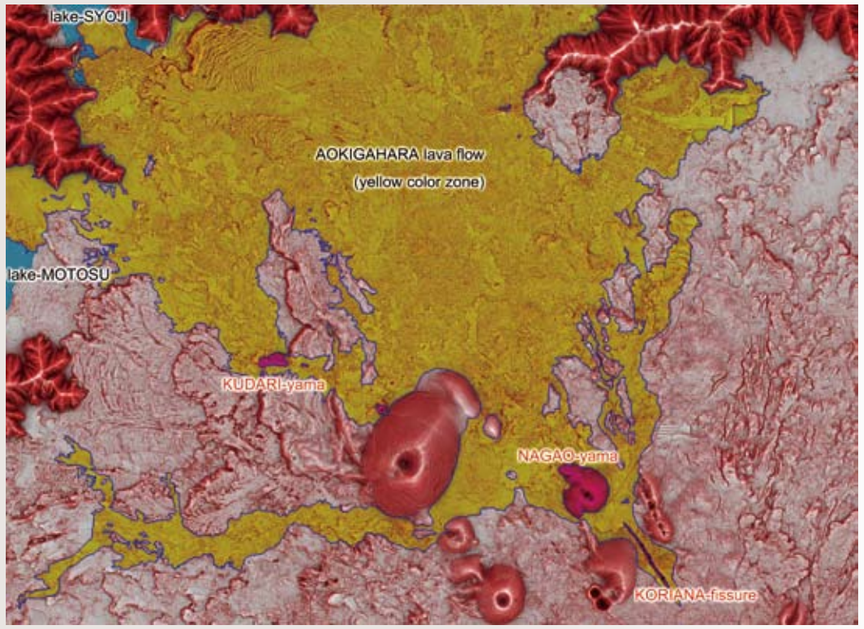
"Red Relief Image Map"

Visualizing System,Visualizing Method,and Viaualizing Program

Japan.Patent No 3670274
C.N..Patent Application No.200380102752.9
U.S.Patent Application No.10/553,675

ASIA AIR SURVEY CO.,LTD.

Unveil topography of Mt. Fuji under forest cover

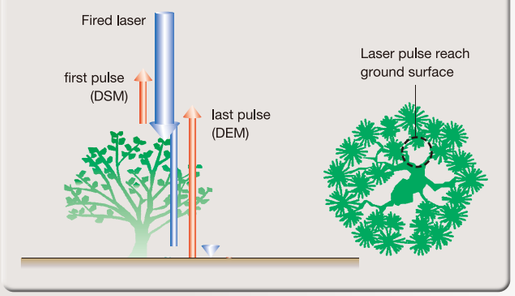


▶ Red Relief Image Map of northwestern slope of Mt. Fuji generated from 1m DEM (Digital Elevation Model) data. Yellow area is Aokigahara lava flow[1].

Aokigahara forest, located at the northwestern foot of Mt. Fuji, grows on Aokigahara lava flow. This lava flow was formed in the 864-866 Jogan eruption of Fuji Volcano - one of the voluminous eruptions in the past 3200 years. The lava flow is covered by dense forest. For this reason, not much topographic and geomorphologic information has become available.

Light Detection and Ranging or LiDAR system could unveil actual topography of vegetation covered areas such as Aokigahara because laser beams can reach the ground surface through small openings in the foliage as the figure on the right shows. This is a great advantage over ordinarily photogrammetric method.

■ Mechanism of LiDAR measurement



Red Relief Image Map[2] technique was developed to fully exploit the value of dense DSM and DEM data derived from LiDAR and to provide easy to understand detailed image of relief conditions.

Advantage of Red Relief Image Map Technique

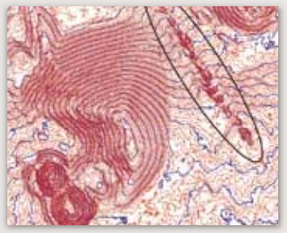
In Aokigahara there is a group of craters lined up in linear formation. (Marked by ellipse in upper right portion of each figure) Ordinary topographic map (upper left figure) cannot show the location and number of craters.

Geomorphologic analysis of the Aokigahara area was conducted by using **Red Relief Image Map**. As the result of this analysis micro topography of lava and location of small craters, which were hidden under dense vegetation, became visible. This finding was also verified by field surveys.

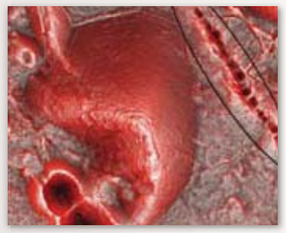
As shown in lower left figure, LiDAR data can show the shape of craters to some extent with contours. However, details of craters are still missing. By using **Red Relief Image Map** techniques, even micro topography become visible.

■ Ordinary topographic map of aerial photograph[1]

■ Color aerial photograph using digital camera[1]



■ Contour map of LiDAR[1]

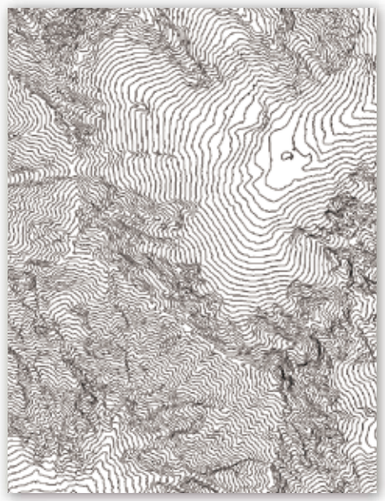


■ Red Relief Image Map of LiDAR[1]

3Dimensional visualization of cliff, slope failure and landslide by Red Relief Image Map using high precision DEM/DSM (Digital Surface Model)

■ Ordinary topographic map

■ Color orthophotograph



■ Contour map of LiDAR

■ Red Relief Image Map of LiDAR

Four figures on the left are of Mt. Hodaka in Northern Alps of Japan. Ordinary topographic maps visualize topography by using contour lines. However, steep slopes are often represented by a symbol instead of contour lines. This representation makes it difficult to know the detailed topographic condition in steep slope areas. contour map made from LiDAR data can be used to draw detailed topography. However, it is not easy to distinguish ridge from valley on contour map. **Red Relief Image Map** technique solves this problem. On **Red Relief Image Map**, ridges are whiter, steep slopes are redder and valleys are darker.

Takahashi-river 0.5m DSM data from LiDAR. Shape of boulders in the slope failure are displayed

Everyone can interpret micro topography using our DEM processing technology (patent protected technology)

"Red Relief Image Map" is artificial color image. And the image is the visualization of the results of various topographic filtering. This is a completely unique technique of relief visualization which is quite different from conventional shaded relief maps and bird's eye view maps.

Advantage

- Micro topography is visible on Red Relief Image Map.
- 3dimensional vision is maintained even if map scale is changed
- Possible to overlay Red Relief Image Map with other types of maps.
- No special skill is required to use Red Relief Image Map and interpret topography
- Possible to increase the efficiency of field survey and to reduce costs