

The topographic expression by Red Relief Image Map contributes to outreach

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1.Introduction

In outreach of earth science, the stereoscopic effect of the terrain is one of the most fundamental and important themes. A Red Relief Image Map(RRIM) that developed for the purpose of representing the detailed topographical data with an airborne LiDAR at an appropriate scale. I will report practical cases for outreach in 15 years from the invention of RRIM.

2.Principle and patent

RRIM is an image adjusted so that it becomes red as the steep slope is more bright, the brighter the ridge, the darker the valley, it is created by calculation from DEM. This method has been exclusively implemented by Asia Air Survey in 2005, but recently implementation of the purpose for research education has been granted free of charge by notification. Recently, it has been created at the GSI. Also for the created archive, the national version of the 10 m mesh of the foundation map of the GSI is released free of charge, and it is displayed in the background such as the geological map NAVI.

3.Case study

1)LiDAR-RRIM have been used for various field surveys and topographical readings because they are easy to recognize the detailed topography from which trees have been removed. It has been used not only for the survey of volcanoes but also for micro topography study of landslides, active faults and plains. In addition, it has been adopted as an exhibition of outdoor signboards and museums in various places. In Izu Oshima and Miyakejima, a LiDAR-RRIM processed into a huge carpet gives the impression to many people on the Izu Peninsula, Unzen and Mt. Fuji. Recently, examples of use are increasing in the survey of tombs, mountain castles and old roads. Even on the paper surface of the newspaper, there are also three-dimensional feeling, so it is often adopted on paper.

2)In the volcanic museum of Izu Oshima, a one-ten-thousandth topographical model of Oshima is installed. This is a RRIM printed by 3D ink jet printer on the surface of a model prepared by precisely machining rigid urethane foam. Because of its high durability, simulated experiments on lava flows can be carried out by letting colored, viscous liquid such as shampoo flow down on the model. Originally designed for real-time simulation at eruption, it is usually used as a teaching material for the general public.

3)This image is a slope diagram plus some ingenuity, making it possible to include more precise topographic information than ever at the same scale. Therefore, it has been used for the ocean bottomography and the globe of the waters near Japan(figure). In collaboration with the Geographical Survey Institute, it was also used to express the topography of the moon, and the expression of craters became a big topic.

4.Finally

It may be difficult for a professional to understand the topography from the contour map only in three dimensions. By thinly overlaying RRIM on the background, it becomes possible to efficiently and accurately recognize. Since such a technique has developed independently in Japan, I would like to spread it to the world in the future.

Keywords: red relief image map, outreach, lava flow, map of seafloor

