

Red Relief Image Map of the terrain representation method of the moon

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Summary

Although detailed terrain data of the lunar surface is obtained, terrain representation technique has become an issue. So called Red Relief Image Map (RRIM), which has been developed specifically for volcanic terrain analysis by LiDAR was applied to the topographic representation of the moon that seems to be similar to the volcanic terrain on the earth. The resulted RRIM of the moon showed effectiveness for visual interpretation of the lunar terrain.

Terrain of the Moon

The moon terrain may be characterized by high land and mariner of basaltic plane. There are several commonly used terrain representation methods. Contouring is very effective method for representing high relief topography, but not quite suitable for enhancing low relief terrain such as lunar surface. Many small scale maps and map atlas employ shaded-relief and/or gradation representation method. Even for the small scale topographic representation of the lunar surface, the shaded-relief and gradient method was used to be employed most of the cases. However, these traditional methods have issues to be solved since there are many craters lie one upon another on the lunar surface. These dipped terrains sometimes erroneously expressed by shaded-relief method depending on the direction of illumination light. Development of more effective terrain representation method is expected to solve these issues.

The RRIM

The RRIM is a method for enhancing terrain relief and is based on concept of slope map. In the RRIM, the slope is expressed by red gradation, and ridge-valley is expressed by intensity of light. Namely, the steeper the slope, the more ridge area, the lighter, and the valley and more dipped terrain, the darker on the RRIM. This image, although it is single ortho-image, provides 3D perspective.

The RRIM of the Moon

The RRIM was applied for making map of the moon. Digital terrain data (DEM) used for making the RRIM was acquired by "Kaguya" lunar mission by JAXA. The DEM has 1/20 degree mesh interval. Presently, The RRIM of the moon can publicly be viewed at home page of Geospatial Information Authority of Japan , MILIT. It is also possible to 3D high speed viewing using Secium and Three.js.

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