

Study of overground openness for crater detection on digital terrain model of Kaguya

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A method of automatic crater detection on the Digital Terrain Model has been developed in the University of Aizu. The extraction of an edge which matches a crater rim on the image is a key procedure of this method. The rim of the crater diameter of not more than 1 km tends to be smooth and unclear. Because a spatial resolution of Digital Terrain Models (DTM) obtained by Terrain Camera of the lunar explorer Kaguya is high, the craters in the DTM are difficult to detect by the current method.

We propose to introduce overground openness into the crater detection technique for crater edge enhancement. The overground openness represents the field of view of the sky over a certain point on the ground. The overground openness is suitable for enhancement of edge because it suddenly changes at a crater rim.

We develop a procedure to derive the overground openness from DTMs, and apply it to lunar DTM from Kaguya. We examine the relationship between the overground openness and crater topography, and evaluate effects of parameters of the algorithm computes the overground openness.