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ボロノイ分割を用いて評価した月全球クレーターの空間分布
Global spatial distribution of the lunar craters characterized by the Voronoi tessellation

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A surface of bodies in the solar system has been exposed by numerous numbers of impact craterings. The impact craters are formed by the hypervelocity impact of meteorites or interplanetary bodies. The impact craterings basically occur at random on the planetary surface. However, the surface of the Moon, which has same rotation and revolution periods, is expected to indicate a bias of spatial distribution of craters even though the surface has a same formation age. According to theoretical analyses, cratering rate altered by this synchronized rotation effect indicates maximum at the apex of leading side and minimum at the trailing side (Zahnle et al., 2001; Le Feuvre and Wieczorek, 2011). On the other hand, this asymmetry of crater spatial distribution by synchronized rotation effect was assessed by Morota et al. (2005) and Werner and Medvedev (2010). Morota et al. (2005) showed that number density of rayed craters at the apex is the highest on the lunar surface. Werner and Medvedev (2010) showed that peak of high number density of rayed craters observed at the distance of about 60? from the apex where is at the leading side including the apex. Because the formation term of rayed craters is in the past from the present to 1 Ga, the synchronized rotation effect of impact cratering had been achieved in this term.

A purpose of this research is to assess the spatial distribution of the global lunar craters without distinction of rayed or not. The assessed craters contain older craters than that of rayed craters, so we could evaluate the synchronized rotation effect at the ancient time before the rayed crater formation. By using the Voronoi tessellation, the global spatial distribution of the lunar craters have the potential of differences by assessing several crater-sets. A result of this research might suggest that the synchronized rotation effect to the lunar craters was not identified in the term before rayed crater formation. In addition to this result, we confirmed the effect of secondary craters which were produced by the Orientale basin formation near the apex.

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