

Formation process of linear gravity anomalies of the Moon

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Gravity data obtained from the Gravity Recovery and Interior Laboratory (GRAIL) have revealed linear gravity anomalies (LGAs), which might be formed by the early global expansion of the Moon and subsequent magma intrusion. If the formation process of the LGAs is true, the surface exposure of mafic rock originated from ancient dykes is expected around large craters, which excavated deep material in the crust. We carried out a compositional investigation to examine existences of intrusion associated with the LGAs using SELENE (Kaguya) high-resolution spectral datasets obtained by Multiband Imager (MI) and Spectral Profiler (SP). Here we investigated LGA2 because the LGA2 is one of the largest LGAs and is superposed by the 150 km-diameter crater Roche, which might excavate intrusion. Clustered small-scale basaltic exposures in the highland are found in the northern outer region of Roche crater across the LGA2. The basaltic exposures exist not at topographic lows but at fresh crater rays and slopes. This indicates that the clustered basaltic exposures originate from the intrusion in the crust and/or ancient maria.

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