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Young Mare Volcanism in the Orientale Region Contemporary with 2 Ga PKT Peak Period

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The crater retention ages of the mare deposits within the Orientale multi-ring impact basin are investigated using 10 m resolution images obtained by Selenological and Engineering Explorer (SELENE, nicknamed Kaguya) spacecraft, in order to constrain the volcanic history of the Moon around the nearside-farside boundary. Precise crater-counting analyses reveal that mare deposits in the Orientale region are much younger than previously thought: ˜2.8 Ga mare basalt in the eastern part of Mare Orientale and ˜1.7-2.2 Ga mare deposits in Lacus Veris and Lacus Autumni, maria along the northeastern rings of the basin. These results indicate that the central and periph-eral regions of the Orientale basin experienced volcanic activities ˜1 and ˜1.8 billion years after the basin-formation impact, respectively. The dominance of uniform surface age across the mare deposits in the peripheral regions strongly suggests that these volcanic eruptions are contempo-rary with the elevated volcanic activity episode proposed for the Procellarum KREEP Terrane (PKT) region on the lunar nearside at around ˜2 Ga and that this activity peak is much more widespread than previously estimated.

Keywords: Orientale Basin, Mare volcanism