# The 1300 km diameters ring fault around Orientale basin from gravity data

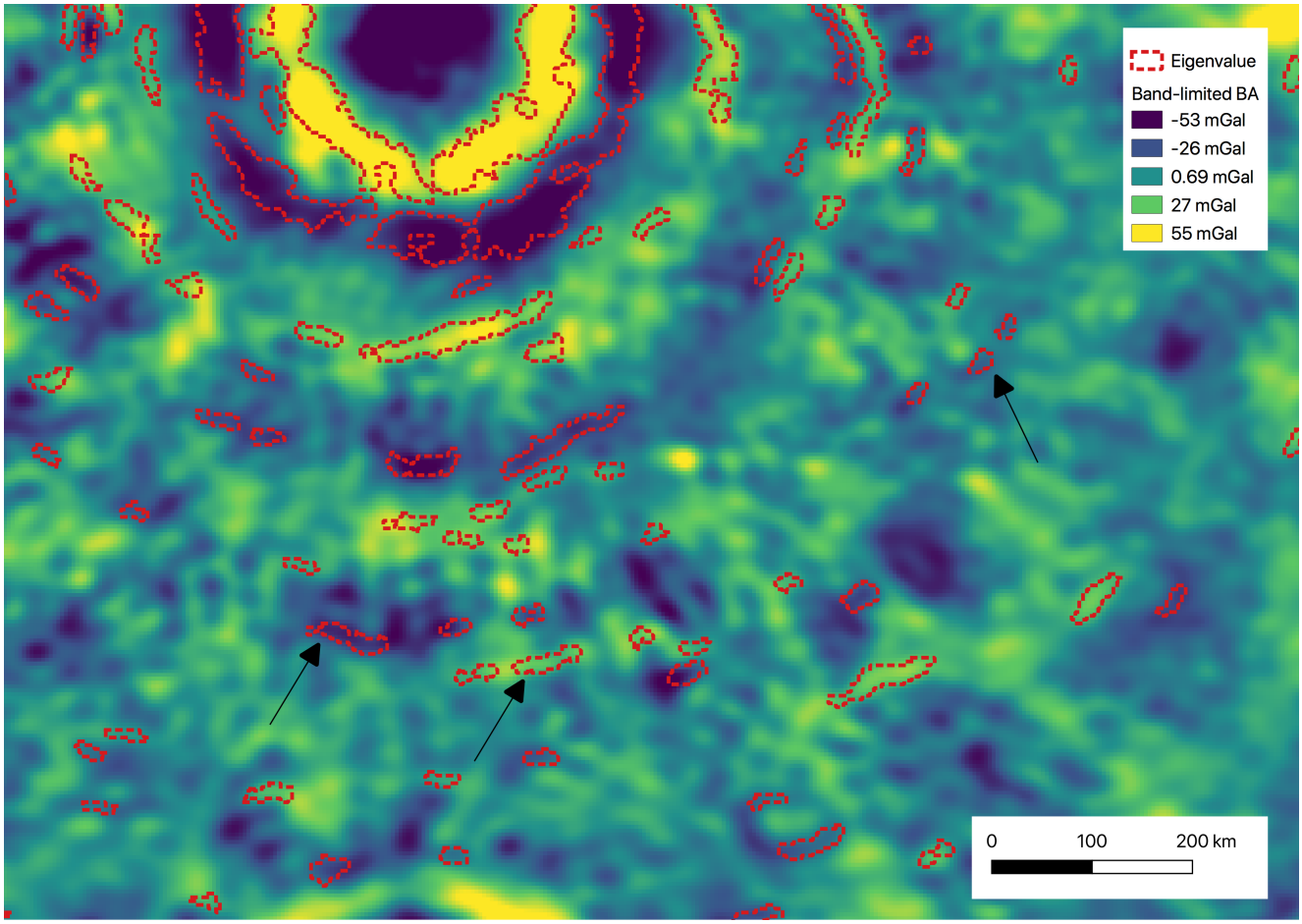
*Qingyun Deng[1], Fei Li[1,2], Jianguo Yan[1], Zhiyong Xiao[3], CHONG ZHENG[1], Chi Xiao[1], Jean-Pierre Barriot[1,4], Mao Ye[1]

1. The State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, 2. Chinese Antarctic Center of Surveying and Mapping, Wuhan University, 3. School of Atmospheric Scienses, Sun Yat-sen University, 4. Université de la Polynésie Française

Orientale basin is the youngest and best preserved multi-ring basin on the Moon, featured with four concentric topography rings. Those inward-facing ring scarps are suggested to be correlated with normal faults induced by the collapse of impact transient crater. GRAIL gravity data further confirmed the existence of deep penetrated ring faults around Orientale basin, which well matching their surface scarps. Geometry of those large scale normal faults provide information about the physical properties of lunar crust, and shed light to impact cratering models. In this work, we proposed a novel gravity gradient eigenvalue to emphasize concentric signatures around Orientale basin in gravity data. The possible 1300 km diameters ring outside Cordillera main rim (D~937km) is reflected in our new eigenvalue map. Gravity inversion indicates its subsurface density structures, suggesting that the modification range of impact cratering is underestimated by previous researches. Implications for the crustal properties and modeling of impact process are also discussed.

Keywords: Gravity inversion, Multi-ring basin, Impact cratering

©2020. Japan Geoscience Union. All Right Reserved. 




©2020. Japan Geoscience Union. All Right Reserved. 