

Dating thrust systems on Mercury: new clues on the thermal evolution of the planet

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The global tectonic scenario of Mercury is dominated by contractional features mainly represented by lobate scarps. These structures are the expression of surface-breaking thrust faults and are linear or arcuate features widely distributed on Mercury. Since they display a broad distribution of orientations, lobate scarps are thought to be related to a global contractional strain, associated to planetary cooling (Watters et al., 1998, *Geology*, 26, 991–994). The age determination of these features will contribute to better constrain whether limits could be placed on when the contraction occurred. For these reasons we dated two thrust systems, located in different regions of Mercury.

The first system is located at the edge between Kuiper and Beethoven quadrangle (latitude $9^{\circ}20'N$ - $23^{\circ}42'S$ and longitude $72^{\circ}73'$ - $59^{\circ}52'W$). These 1500-long thrust system is constituted by several lobate scarps with a NNE-SSW orientation.

The second thrust system considered in this work is the Enterprise Rupes, a 820 km-long scarp system that cuts the Rembrandt basin.

We dated the activity of these systems through the buffered crater counting technique, which is used to derive absolute model ages of linear landforms (e.g. Fassett and Head, 2008, *Icarus*, 198, 37–56; Giacomini, et al, 2015, *GSL*, 401, 291–311). The results gave comparable ages for the two systems and suggest that the activity along major rupes all around planet Mercury have most probably begun before 3.5 Ga. This will give us new clues to better understanding the thermal evolution of the planet.