



Magnetic patterns of impacts craters

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Based on the newest global models and maps, a systematic analysis of the topographic and magnetic features over 98 largest craters on Earth, Mars and Moon has been carried out. Firstly, craters have been identified by their quasi-circular features from the most recent and detailed topographic maps and then, from available global magnetic maps. Then, we have used the intensity field to establish tendencies and patterns of the magnetic signatures.

A large variety of magnetic signatures are encountered in the impact structures of the terrestrial bodies and here we document systematic trends in the amplitude and frequency of the magnetic patterns inside and outside of these structures. The demagnetization effects due to the impact shock wave and excavation processes have been evaluated too, applying a forward modeling approach, using the Equivalent Source Dipoles method.

The main magnetic characteristics of the chosen impact craters are presented by means of a QML (Qualitative Magnetic Label) parameter. We have considered three possible cases, depending on the total field values inside the central rim and outside it, considering the different existing number of rings, varying from 1 to 5. They are represented by comparable, higher or lower values of the total field between the selected boundaries. Finally, an inter-planetary comparison is presented using the specific trends in the magnetic signatures of the selected impact craters.