

Fresh Impact Craters and Clusters on Mars

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Ongoing formation of fresh, single, decameter-scale impact craters and clusters of such craters, during modern spacecraft missions, was recorded by the Mars Global Surveyor mission and by the Mars Reconnaissance Orbiter [1-3]. Thin Martian atmosphere and lower average meteoroid entry velocity contribute to less intense fragmentation compared to the terrestrial bolides, nevertheless the clusters indicate that roughly 50% of the incoming meteoroids fragment in the Martian atmosphere.

Analysis of these clusters, their comparison with different fragmentation models [4] provide possibility to study the physical properties of meteoroid population. A comparison of the Martian meteoroid strength with observations of terrestrial meteoroids demonstrates that they don't contradict each other. Analysis of cluster sizes and dispersion of the fragments, craters distribution in the clusters allow to study the fragmentation details, which can't be revealed in the terrestrial conditions. Preliminary consideration of the craters distribution permits to select various types of fragmentation, which may possibly be related with different properties/structure of meteoroids.

References:

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