

Hydrological and Debris-flow simulation of Martian Surface in Hesperian & early Amazonian epoch

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It is considered that the Mars in Noachian epoch to early Amazonian was much warmer temperature than current condition, with atmosphere and ocean supported by its magnetic activity. Several valley which seems to be developed by ancient hydrological processes are observed in Martian surface, is being considered to be built long time before. Some fluvial fan was formed during the following Hesperian to early Amazonian epoch, which is considered as much cooler and drier than Noachian epoch. In this study, we applied Hydro-debris 2D model into Martian surface in Hesperian epoch in order to try developing surface valley formation throughout hydrological processes. Sediment transport and associated small-scale debris-flow occurrence may be the key for valley formation, where might be the micro-habitable zone in ancient period. At the same time it is still uncertain how much precipitation and erosion should have been required to formulate such topography. Large-scale inverse analyses using the proposed model might be the key for future answer to prevail this mystery.

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