

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

*佐藤 啓明²、山敷 庸亮¹、黒木 龍介¹、宮本 英昭³、逸見 良道³

*Hiroaki Sato², Yosuke Alexandre Yamashiki¹, Ryusuke Kuroki¹, Hideaki Miyamoto³, Ryodo Hemmi³

1. 京都大学大学院総合生存学館、2. 京都大学工学部、3. 東京大学工学系研究科

1. Earth & Planetary Water Resources Assessment Laboratory Graduate School of Advanced Integrated Studies in Human Survivability Kyoto University, 2. Faculty of Engineering, Kyoto University, 3. Graduate School of Engineering, The University of Tokyo

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. Following the last year's calculation we attempted to compare several cases of debris flow experiments by changing hypothetical precipitation rate and erosive coefficients in the initially distributed regolith.

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