



MarsSedEx III: linking Computational Fluid Dynamics (CFD) and reduced gravity experiments

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Experiments conducted during the MarsSedEx I and II reduced gravity experiments showed that using empirical models for sediment transport developed on Earth violates fluid dynamics. The error is caused by the interaction between running water and sediment particles, which affect each other in a positive feedback loop. As a consequence, the actual flow conditions around a particle cannot be represented by drag coefficients derived on Earth. This study examines the implications of the gravity effects on sediment movement on Mars, with special emphasis on the limits of sandstones and conglomerates formed on Earth as analogues for sedimentation on Mars. Furthermore, options for correcting the errors using a combination of CFD and recent experiments conducted during the MarsSedEx III campaign are presented.