



Modeling gas transport in the Martian subsurface

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Modeling gas transport through Martian subsurface and outgassing processes is essential in the study of atmospheric evolution of Mars. We present an overview of gas transport in Martian soil focusing on water vapor and methane diffusion to explain the recent observations of methane in Martian atmosphere with a diffusive transport model. The range of parameters that have the largest effect on transport in Martian conditions is investigated. Among the possible sources of methane, clathrate hydrates destabilization is one potential mechanism. Hydrate stability zone in subsurface is also investigated.

In 2016, ExoMars Trace Gas Orbiter (TGO) will have the capabilities to detect and characterize trace gases in Martian atmosphere and will bring additional information to validate the different possible outgassing scenarios.