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Experimental simulation reveals that the mud behaves like the lava under the Martian conditions.

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Here we present results of mud experiments performed inside a low pressure chamber to investigate the mechanisms of sedimentary volcanism on the cold Martian surface. Experiments reveal that a low pressure environment changes the behavior of mud and hence the shapes of the resulting mud flows. The experiments showed us that if the mud is extruded in a low pressure environment on a cold surface, then the mixture rapidly freezes at the edges of the flow. As a result an icy-muddy crust is formed. This crust acts as a protective layer isolating the inner part of the mud flow from the “hostile” cold and low pressure ambient environment. This means that the mud can remain liquid in the core and flow for a prolonged period of time (depending on the thickness) and hence can propagate over larger distances.
The behavior of the mud mixture in such environments appears to be similar to the propagation of low viscosity pahoehoe lava which is also protected by a cooled external crust surface insulating the lava flow from the surrounding environment. This has profound implications for the interpretation of many Martian surface features whose origin by mud or lava is debated. Our results suggest that the observed mud propagation behavior should also affect the final morphologies at larger-scale and therefore, that Martian mud volcanoes may actually differ from their terrestrial counterparts. Therefore care must be taken when surface features are compared that formed under different PT conditions.