Detailed morphology of Vallis Schröteri.

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We restricted to the eruptive temperature with comparing the predicted depth profile by thermal erosion model with the observed one along the Vallis Schröteri. First, we assume that this sinuous rille could be explained by a simple sustained lava flow process but rather is formed by two or more stages of eruptions and/or by blanketing of ejecta due to the formation of the Aristarchus crater. The effusion rate of the sustained lava flow required to explain this sinuous rille is order of 106 m3/s, which is comparable value to upper limit of continental flood basalt on the Earth (e.g., CRB; 4.0 x 104 to 1.5 x 106 m3/s, ˜17 Ma). Since the temperature of the eruption strongly affects the thermal erosion of the substrate ground, the volume of lava necessary to produce the Vallis Schröteri is also affected by the eruptive temperature. The volume of single sustained lava flow to produce the Vallis Schröteri is restricted to the maximum volume of lava ponds considered the candidates for single eruptive phase; therefore, the lava flow with eruptive temperature more than liquidus temperature could produce the rille. The Vallis Schröteri is one of evidence of high eruptive temperature on the Moon. The high eruptive temperature is supported by studies of eruptions on the lunar surface that were interpreted as a buoyant mechanism of basaltic magma within the Moon.