



## **Preliminary assessment of the effusion rate of an inflated flow in Daedalia Planum using volume estimate and crater counting age determination**

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The detection of pahoehoe flows with inflation features on some Martian lava fields (Keszthelyi et al., 2008; Giacomini et al. 2009) suggests that inflation played an important role on the emplacement of lavas on Mars. In particular moderate and long lasting effusion rates coupled with very efficient spreading processes could have cyclically occurred in the Arsia Mons volcano during its eruptive history. This finding has an important consequence on the estimation of effusion rates and rheological properties of lavas on Mars as they are normally derived assuming non inflated flows. The calculations can be affected by overestimations if applied to flows dominated by inflation. In the case of some Daedalia Planum flows this calculations indicated effusion rates, yield strength and viscosity which can be reasonable for aa or platy ridge flows but are improbable for the pahoehoe lavas found in the region. Since there are no model linking the magmastatic overpressure of the inflated flows (e.g. Rossi and Gudmundsson, 1996) to the effusion rate so far, we have tentatively derived the minimum effusion rate responsible for the emplacement of one inflated flow of Daedalia Planum considering its volume and its maximum time span of emplacement. The volume has been derived from MOLA and HRSC data, whereas the maximum time span of emplacement was assessed by age determination through crater counting on HiRISE images.