



Joint Press Release

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Volcanic eruptions and quakes may be currently ongoing on Venus

D’Incecco et al. suggest that volcanic eruptions and associated tectonic activity may be ongoing on Venus at Idunn Mons volcano. The international team have, for the first time, combined different lines of evidence from the atmosphere to the surface to suggest such geologic activity on a terrestrial planet in the Solar System, other than Earth. This is the conclusion proposed by an international team of planetary scientists in their research work, recently published on the Planetary Science Journal, whose link is available here: <https://iopscience.iop.org/article/10.3847/PSJ/ac2258>

In 2010 the ESA Venus Express probe for the first observed high emissivity anomalies over the top and eastern flank of Idunn Mons, a 200 km wide volcano of Venus. These types of emissivity anomalies suggest fresh unaltered lava flows, which implies the possibility of geologically recent volcanism on Venus. In fact, the study from 2010 concluded that volcanic eruptions at Idunn Mons may have occurred during the past few million years.

Using a wholistic approach, an international team of planetary scientists has for the first time comprehensively investigated all the available evidence from the surface to the atmosphere for recent volcanic eruptions and tectonic activity at the Idunn Mons volcano. “It is the first time we have combined so many and different evidence suggesting ongoing eruptions as well as recent seismic activity on a Terrestrial planet other than Earth”, says Piero D’Incecco, the lead author of this new study working as planetary scientist at the engineering-geology (INGEO) department of the Università degli Studi G. d’Annunzio in Chieti-Pescara, Italy.

The geologic interpretation of the study area showed that Idunn Mons may have erupted very recently, and that tectonic activity may also be currently ongoing in the region associated with the volcanism. Idunn Mons is suggested to have fresh unweathered lava flows based on orbital measurements. To constrain the age of these flows, recent experimental laboratory studies have revealed that the chemical alteration of the surface of Venus may act much faster than previously expected, in the order of months to years. This means that the anomalies observed in 2010 may suggest the occurrence of currently ongoing volcanism on Venus. Recent tectonism is supported by fracturing surrounding Idunn Mons, which is likely associated with the volcanism.

As a further line of evidence of ongoing volcanic activity, atmospheric data also show anomalies in the speed of the winds in the lower atmosphere over Imdr Regio, where Idunn Mons is located. These observed atmospheric anomalies may be related to very recent or ongoing volcanism on Venus. “Importantly, sites characterized by ongoing eruptions may possibly help us constraining the distribution and relative abundance of gases possibly related to microbial life such as phosphine, as recently detected in the atmosphere of Venus” says Piero D’Incecco.

The research team includes planetary scientists, some of which are involved with various near-future Venus missions: besides Piero D’Incecco (Università d’Annunzio, Chieti-Pescara, Italy / Arctic Planetary Science Institute, Rovaniemi, Finland), the lead author of the article, the research study also includes Justin Filiberto (Lunar and Planetary Institute, Houston, TX, USA; co-investigator of the DAVINCI+ mission), Iván López (Universidad Rey Juan Carlos, Madrid, Spain), Dmitry Gorinov (Space Research Institute of the Russian Academy of Sciences, Moscow, Russia; science team member of the Venera-D mission) and Goro Komatsu (Università d’Annunzio, Chieti-Pescara, Italy / International Research School of Planetary Sciences, Pescara, Italy; Science Study Team member of the EnVision mission).

The study is titled “Idunn Mons: Evidence for Ongoing Volcano-tectonic Activity and Atmospheric Implications on Venus” and can be found at <https://iopscience.iop.org/article/10.3847/PSJ/ac2258>

Additional information:

Dr. Piero D’Incecco
Università d’Annunzio, Chieti-Pescara, Italy
Mobile: +39 3894629883 (availability: Mon to Fri, 08-18 CET)
Email: piero.dincecco@unich.it