Geophysical Research Abstracts
Vol. 21, EGU2019-15919, 2019
EGU General Assembly 2019

The Dallol Geothermal Area, Ethiopia — an unique Planetary Field Analog on Earth

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The Dallol volcano and its associated hydrothermal field are located in a remote area of the northern Danakil Depression in Ethiopia, a region only recently appraised after decades of inaccessibility due to severe political instability and the absence of infrastructure. The region is notable for hosting environments at the very edge of natural physical-chemical extremities.
The study of planetary field analog environments plays a crucial role in characterizing the physical and chemical boundaries within which life can exist on Earth and other planets. It is key to the assessment and criteria definition of the conditions of habitability on other planets, including the possibility for biosignature preservation and in situ testing of technologies for life detection. The Dallol area represents an excellent Mars analog environment given that the active volcanic environment, the associated diffuse hydrothermalism and hydrothermal alterations, and the vast acidic sulfate deposits are reminiscent of past hydrothermal activity on Mars.

This is a contribution to the Europlanet 2020 Research Infrastructure programme funded under the European Commission's Horizon 2020 programme (No 654208).