# The use of atmospheric chemistry to characterise how mantle processes have contributed to Earth's environmental distinction

SAMI MIKHAIL[1,2], AUBREY L ZERKLE[1,2], DUNCAN H FORGAN[1,2], MICHAEL J HEAP[3], DIMITRI A SVERJENSKY[4], PETER H BARRY[5]

*[1]The University of St. Andrews, UK [sm342@st-andrews.ac.uk]; [2]Centre for Exoplanet Science, St. Andrews; [3]Institut de Physique de Globe de Strasbourg Universitéde, EOST, France; [4]Johns Hopkins University, USA; [5]The University of Oxford, Oxford, UK*

Earth's atmosphere is chemically distinct among the telluric planets of our Solar System. The interplay between volcanism and tectonics have resulted in Earth's atmosphere showing a relative enrichment for $N_2$/primordial noble gases (Mikhail & Sverjensky, 2014) due to a subduction-induced chemical effect on the speciation of mantle nitrogen (Mikhail et al., 2017; Zerkle, & Mikhail, 2017). For Venus, the absence of Earth-like tectonics has resulted in a relative quiescence of volcanism, which is reflected in the less radiogenic $^{40}Ar/^{36}Ar$ ratio of its atmosphere (Mikhail & Heap, 2017). Venus also has a much more massive atmosphere than Earth, which can be expressed as a higher $^{20}Ne/^{28}Si$ ratio of the bulk planet. The relative difference in the Hill Spheres of Earth and Venus has resulted in dissimilar post-accretionary exogenic fluxes to the telluric planets which effected their atmospheric development (Forgan & Mikhail, *under review*). This presentation will synergise several insights into one narrative to describe and explain some key distinctions between the atmospheres of Earth and the other telluric planets can be ascribed to the direct influence of plate tectonics on mantle petrology, and geochemistry.

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