Please ensure that your abstract fits into one column on one page and complies with the *Instructions to Authors* available from the Abstract Submission web page.

^{40}Ar-^{39}Ar, chemistry and mantle source modelling of Apollo 17 basalts

ASSIS FERNANDES V.[1,2,3*], CZAJA P.[1], FAWCETT L.[2], KHAN A.[4], LIEBSKE C.[4], NEAL C.[5] AND SLIWINSKI J.[4]

[1]Museum für Naturkunde, Invalidenstrasse 43, 10115 Berlin, Germany (*correspondence: veraafernandes@yahoo.com)
[2]SEES, Univ. Manchester, Oxford Rd., Manchester, UK,
[3]Geology Dept., Inst. IDL, Univ. Lisbon, Lisbon, Portugal,
[4]Dept. Earth Sci., ETH-Zürich, Switzerland,
[5]Dept. Civil & Env. Eng. & Earth Sci., Univ. Notre Dame, Indiana, U.S.A.,

Serenitatis basin shows 29 spectrally different lava compositions on its surface [1]. At depth, the chemical diversity of buried flows is not known, making it difficult to assess the complete evolution of the mantle under this basin. Apollo 17 basalts are typically characterized by 6-7 types with an age range of 3.75-3.65 Ga [2,3]. For both vertical and horizontal representation, initially 25 2-4 mm Apollo 17 basaltic regolith fragments from soils 71063/4, 74243/4, 75063/4 (Steno, Shorty, & Camelot crater ejecta, respectively) were obtained. Here, chemical composition and ^{40}Ar-^{39}Ar ages for seven are presented. Ejecta from these small craters come from depths greater than any of the Apollo 17 drill-cores, potentially sampling material from underlying lava flows and intercalated regolith probably including local and regional material (i.e. other Mare Serenitatis flows). Results obtained using different analytical techniques are compared with literature data to evaluate mantle source(s) evolution under the Serenitatis Basin.

SEM/EMP – the different basaltic fragments show a variety of textures and mineral/matrix compositions: six fragments are high-Ti basalts, of types A, B and C, with textures ranging from pyroxene and olivine porphyry, to dolerite and vitrophyres. One low-Ti basaltic fragment is potentially an impact melt.

^{40}Ar/^{39}Ar ages – Ar-ages were acquired for the 7 basaltic fragments, using the IR-laser step-heating techniquend. Ages obtained range between 3.66 Ga and 4.01 Ga extending the range previously reported.

Magma generation and depth – initial modelling [4] using bulk compositions determined from the major element composition of major minerals and their volume percent show the basalts originated at similar depths [5] as other Apollo 17 basalts [6]. However, there is no direct correlation between depth, age and type suggesting heating of the lunar mantle to be heterogeneous, but similar magma generating processes.

[1] Hiesinger et al. (2000) JGR 105, 29239-29275. [2] Paces et al. (1991) GCA 55, 2025-2053. [3] Tartèse et al. (2013) Amer. Min. 98, 1477-1486. [4] Lee et al. (2009) EPSL 279, 20-33. [5] Khan et al. (2014) JGR 119, doi:10.1002/ 2014JE004661. [6] Mare Basalt Databasehttp://www3. nd.edu/~cneal /Lunar-L/.