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## V11C-0353: $^{40}\text{Ar}$ - $^{39}\text{Ar}$ age clustering in the active phonolitic Cadamosto Seamount (Cape Verdes): Indications for periodic magmatic activity

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**Monday, 11 December 2017**

**08:00 - 12:20**

📍 *New Orleans Ernest N. Morial Convention Center - Poster Hall D-F*

The Cape Verde archipelago is situated ~400-800 km off the west coast of Africa and is comprised of a northern and southern chain of islands and seamounts. Morphological observations and previous radiometric dating of the islands indicate a slow age progression, over ~22 Ma, from east to west (Holm et al. 2008). We present the first radiometric ages for Cadamosto Seamount, which is composed of complex evolved volcanics and is situated at the southwestern tip of the Cape Verde archipelago (e.g. Barker et al. 2012).

We analyzed five different submarine phonolites that were sampled by remotely operated vehicles (ROV) Kiel 6000 and dredging during the *RV Meteor* (M80/3) and *RV Poseidon* (POS320/2) cruises. Fresh sanidine, nepheline, and biotite grains were selected and carefully prepared for  $^{40}\text{Ar}$ - $^{39}\text{Ar}$  single grain total fusion analysis.



Sanidine single grain  $^{40}\text{Ar}$ - $^{39}\text{Ar}$  ages from 5 samples range from  $11.5 \pm 6.5$  ka to  $349.0 \pm 20.4$  ka ( $2\sigma$  errors), and cluster in several age groupings (using the decay constant and atmospheric air ratio of Steiger & Jäger (1977), and age standard TCS2 ( $27.87 \pm 0.04$  Ma;  $1\sigma$ ; M.A. Lanphere, pers. comm.)). Three age groups can be identified within the youngest (0-170 ka) sanidines, which are separated by periods of ~52-54 ka. Nepheline grains from one sample yielded much older ages of  $169.5 \pm 16.5$  ka to  $1521.5 \pm 8.3$  ka ( $2\sigma$ ).

Our data suggests young ages for the Cadamosto Seamount, which is in accordance with recorded seismic activity (Grevemeyer et al. 2010), and its position adjacent to the recently active islands of Fogo (last eruption in 2014/2015) and Brava (recent seismic activity). The different sub-groups of sanidine  $^{40}\text{Ar}$ - $^{39}\text{Ar}$  ages can be used to identify different activity maxima corresponding to cycles of magmatic productivity in a long-lived magmatic system. Ongoing petrologic investigations will be used to identify the relative importance of processes such as mantle melting rates, magma replenishment and magma chamber processes.

### References:

Barker A.K. et al. (2012) *Contrib. Mineral. Petrol.* 163, 949–965.

Grevemeyer I. et al. (2010) *Geophys. J. Int.* 180, 552–558.

Holm P.M. et al. (2008) *J. Geophys. Res.* 113, doi:10.1029/2007JB005339,   2008.

Steiger R.H., Jäger E. (1977) *Earth Planet. Sci. Lett.* 36, 359–362.

## Plain Language Summary

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