

Interactive comment on “Eruptive history and ⁴⁰Ar/³⁹Ar geochronology of the Milos volcanic field, Greece” by Xiaolong Zhou et al.

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I was surprised to be asked to review this manuscript as I had reviewed a previous version for another journal earlier this year. I made that prior review clear when I accepted the review request. My prior review has not been acknowledged by the authors, even though they incorporated many of the changes I suggested and made corrections to errors I had identified.

That said, this manuscript has the potential to contribute important geochronological data on the volcanic history of Milos. Geochronological data are a critical element in understanding volcanic evolution and are often lacking in volcanological studies. I am not a geochronologist and cannot critically assess the quality of the geochronological

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methods and data presentation. The authors have thoroughly researched previous geochronology studies on Milos and competently present the context.

One of the fundamental flaws I identified in the previous version persists in this version. The authors propose numerous "phases" of volcanic activity lasting tens to hundreds of thousands of years separated by equally numerous and variably long periods of "volcanic quiescence" based on their new dates and existing dates on volcanic units. However, the notion of successive "phases" is misleading because of the implication that the phases are periods of continuous volcanism. The dated eruption events in fact occupy geological "instants", the longest activity being that of large domes and dome complexes that might take months to years to decades to be emplaced (still geologically instantaneous). Allied to this is the misconception that there were distinct quiescent periods. Most of the history of Milos was volcanic quiescence. Essentially each of the proposed phases is based on the age of one or a couple of volcanic centres (that is why there are so many) without any regard to patterns in the location, style and composition of volcanism. The division of the evolution into active phases and quiescence does not add to our understanding of the evolution of Milos or indeed any volcanic edifice. The result of this approach is confusion rather than clarity.

Correction of this flaw requires thorough revision of section 4.3 in the Discussion and all of the Conclusions (and part of the Abstract). Also, because this manuscript does not present any new volcanological data, much of the volcanological interpretation in this section (4.3) which has been taken from the cited references ought to be deleted. The revised section 4.3 could describe the tempo of edifice growth and the spatial distribution of volcanic centres through time without resorting to artificially defined phases.

Section 4.1 should be reduced to half its present length by omitting the irrelevant review of geochronological methods. Such review is appropriate for a thesis but not appropriate for a paper.

This version of the manuscript incorporates some interesting data on magma produc-

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tion rates and comparisons with other arc settings. These topics can be legitimately be covered because they dont depend on original data having been presented, and instead depend on the available literature.

There numerous English errors. I corrected some but not all on the annotated text and the figures (attached - please download for these corrections and further comments). some of the figures need further work - confusing labels or labels that are inconsistent with the caption or the text.

Please also note the supplement to this comment:

<https://gchron.copernicus.org/preprints/gchron-2020-30/gchron-2020-30-RC1-supplement.pdf>

Interactive comment on Geochronology Discuss., <https://doi.org/10.5194/gchron-2020-30, 2020>.

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