Authors's response to reviewers' comments and revised manuscript with track-changes

Manuscript title: Eruptive history and $^{40}Ar/^{39}Ar$ geochronology of the Milos volcanic field, Greece

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Dear editor,

We are pleased with the two constructive official reviews of Jocelyn McPhie and Jörn-Frederik Wotzlaw and one comment by Jon Naden et al. regarding our sample locations. We have addressed the major concerns of the reviewers regarding the interpretation of the volcanic history of Milos and have modified this according to suggestions by the reviewers.

The detailed responses to the reviewers' comments are in this attachment and the revised manuscript with track-changes below. The reviewers' comments are in black, and our response is in blue.

Your sincerely,

The authors

Referee #1: Jocelyn McPhie

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.

A previous version of this manuscript was indeed reviewed by Dr. McPhie and we also followed her advice to submit the paper to a journal with an emphasis on geochronological work. The detailed suggestions and constructive criticism of Dr. McPhie considerably improved the version of the submitted manuscript. However, we were not sure how to handle this in the acknowledgements, since this is a new submission to another journal. However, we very much appreciate that Dr. McPhie has given twice constructive criticism and detailed comments on two versions of this geochronological work, and we will, of course, acknowledge both her reviews in the final manuscript.

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

We thank Dr. McPhie for the nice words for the geochronological data and literature review.

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.

We accept Dr. McPhie's argument that the Milos Volcanic Field (VF) was characterized by volcanic quiescence for most of the time and that there were only brief episodes of volcanism in the ca 3.5 Ma volcanic evolution of the Milos VF. Although we did clarify in this version of the manuscript how we define our concept of phase (location, volcano type, composition), this was not made sufficiently clear to the reviewers (see also the review of Dr. Wotzlaw). We, therefore, followed the suggestions of both reviewers to focus on the volumetric growth of the Milos VF (Fig. 12 in the revised manuscript), and defined two periods of slow growth, and one with fast growth. This volumetric growth curve is based on our new $^{40}Ar/^{39}Ar$ data in combination with previously published surface area and thickness data from Fytikas et al., 1986 and Stewart and McPhie, 2006. These "periods" of slow/fast growth of the volcanic edifice are clearly defined and will be used in a second paper to predict the eruption frequency and the magma flux. Figure 11, 12 and 15 have been updated and combined to new figures 11 and 14, and are shown in the revised manuscript. These two new figures are crucial for the discussion and have been updated to incorporate the suggestions from Dr. McPhie and Dr Wotzlaw. We have rewritten section 4.3 as suggested based on these new figures and Table 5.

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.

The details of the $^{40}Ar/^{39}Ar$ age technique required in the paper depend on the background of the reviewers, as we have already discovered with the previous version of this manuscript. Reviewers with a volcanological/petrology/geochemical background want these sections reduced or removed, whereas reviewers with a background in $^{40}Ar/^{39}Ar$ geochronology argue that the discussion of the $^{40}Ar/^{39}Ar$ data is too limited. Given that we have followed the suggestion of Dr. McPhie and submitted a revised manuscript to a journal in the field of geochronology, we have proposed a compromise that satisfies the concerns of referees from both communities by presenting the $^{40}Ar/^{39}Ar$ data in such a way that both communities are satisfied by reducing figures 5-9 and moving most of the detail in the individual step discussion of the $^{40}Ar/^{39}Ar$ results of figures 5-9 to the supplementary material.

This version of the manuscript incorporates some interesting data on magma production rates and comparisons with other arc settings. These topics can be legitimately be covered because they don't depend on original data having been presented, and instead depend on the available literature.

We do not understand the point made by Dr. McPhie here. We discussed the temporal variations in the long term volumetric volcanic output rate (Q_e) of the Milos VF in section 4.5. This section includes the estimations of the long term volumetric volcanic rate and magma production rate for the Milos VF. We did these estimates mainly based on our twenty-one new $^{40}Ar/^{39}Ar$ ages, and previous geochronological and volcanological works of Fytikas et al. (1986) and Stewart and McPhie (2006).
In contrast, the magma production rate is the representation of magmatism in or underneath the crust. We tried to find the solution to connect Q_e to magma production rate by discussing the ratio of the volumes of intruded magma in the crust to the volcanic units extruded onto the surface (I:E). This ratio is obtained from the study of White et al. (2006) that suggests a ratio of 5:1 as a realistic estimate for most volcanic centres. Our calculation of the magma production rate is comparable to that underneath the Kameni island of the caldera of Santorini (e.g. Druitt et al., 2019). However, considering that the magma volume in the crust underneath Milos is unknown, we admitted that we could only give a very rough estimate on the magma production rate. Although this rough estimate relies on a formula that comes from the literature (Jicha and Jagoutz, 2015), it still needs our geochronological data to constrain the different periods of different rates of volcanic output and/or magma production. Therefore, we felt that it is necessary to keep these topics instead of omitting them.

There are 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.

We have rectified the language mistakes in the main text and figures as suggested by Dr. McPhie.

Please also note the supplement to this comment: https://gchron.copernicus.org/preprints/gchron-2020-30/gchron-2020-30-RC1supplement.pdf.

We appreciate the suggestions that Dr. McPhie has made and we have accommodated most of them in our revised manuscript. We made a table to response to these specific comments for the text, tables and figures of our original manuscript below.

Response to the specific comments of Jocelyn McPhie for texts and tables.

Line number	Comment by Jocelyn McPhie	Comment by authors	New page/line
15-20	fix Abstract after the text has been revised	Abstract has been fixed according to revised text	P1/L20-26
32	why is effusive volcanism eliminated? most big volcanoes grow by means of both explosive and effusive eruptions.	Replaced the "(explosive)" with "effusive and explosive"	P1/L36
61	Deleted "as lithics"	Changed to "found as lithic blocks in many volcanic units"	P2/L65
62	Deleted the "s" of the words of "eclogites and schists"	Changed accordingly	P2/L66
64	What is the "green lahar unit"?	Added the reference, Fytikas (1977), as explanation	P2/L68
67	Highlighted the "and that is unconformable overlain" as scrambled sentence	Changed to "that is unconformable"	P2/L71
144	Highlighted "fresh pyroclastic material" indicated with "clarify - I presume you mean juvenile clasts such as pumice clasts from pyroclastic deposits? or do you mean lithified/welded pyroclastic deposits?"	Changed to "fresh juvenile pryoclastic material"	P4/L148
169-173	Highlighted "are"	Changed to "were"	P5/L173-178
175-176	Highlighted "is"	Changed to "was"	P5/L180
189	Highlighted "Major-element analysis"	Changed to "Whole-rock major element analysis by XRF"	P5/L194
190	Highlighted "Major-element concentrations"	We did not change it.	P5/L195
193	Pointed out a missing word between "before" and "mixed"	Added "being" in between	P5/L198
201	Pointed out a missing word between "are" and "pumiceous"	Added "from" in between	P6/L206
228	Highlighted "an extrusive dyke" with indications of "doesn't make sense; dykes by definition are intrusions"	Changed to "a dyke"	P6/L233
323	Highlighted the worng spelling of "Trahilas"	Corrected as "Trachilas"	P9/L328
383-384	Highlighted the sectence, "Apart from…(~2.66 Ma) volcanoes" with a comment of "excluding all these parts of the sequence means the conclusion is meaningless "vesicularity (0.1-10%) and crystallinity (10-40%) tends to become higher with younger deposits""	Included the pumiceous units to present the variations of crystallinity and vesicularity, except for the pumiceous units of Profitis Illias due to the lack of geochemical and petrological data.	P10/L388-396
386-388	Highlighted the sectence, "The ratio…was subaerially added" with a comment of "this result is meaningless because you have no data on the submarine part of the volcanic edifice"	Deleted the according sentence.	P10/L397-398
394-430	Deleted the content that is related to the literature reviews of K-Ar and $^{40}Ar/^{39}At$ methods of section 4.1	See comment above. We still keep this content so the reader with geochronological background can judge the quality of the data. We have reduced figure 5-9 by moving most of the detail of the of the $^{40}Ar/^{39}Ar$	P11/L404-440

		results to the supplementary material II.	
431	Highlighted “fission track ages” with comments of “not in caption or labelled on figure”	Changed accordingly	P12/L443 and ?
441	Highlighted “in these ages (Angelier_3-5 in Figure 13)” with a comment of “not on fig. 13”	Changed accordingly	New Figure 12
457	Highlighted “Both of them are from derived the coherent dacite” as scrambled sentence	Changed to “Both these samples are derived from the coherent dacite”	P12/L467-468
471	Highlighted the typo “unites”	Corrected as “units”	P13/L480
481	Highlighted “In addtion, the the Sarakiniko pumice (1.85 ± 0.10 Ma with 13.6 $^{40}Ar^{*}$ (%), Fytikas et al., 1986) deposits eastward of Adamas” with a comment of “this is not a sentence”	Changed to “Fytikas et al. (1986) also analysed a pumice from the Sarakiniko deposits eastward of Adamas (1.85 ± 0.10 Ma with 13.6 $^{40}Ar^{*}$ (%), Fytikas et al., 1986”)	P13/L493-494
486	I have not tried to correct this text because it needs major revision. The main problem is that the authors misunderstand what their dates actually mean. 1. 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). 2. Allied to this is the misconception that there were distinct quiescent periods. Most of the history was volcanic quiescence. 3. There has been no attempt to identify patterns in the location, style and composition of volcanism. such patterns, if they exist, could be the basis for defining phases, not simply dates on separate units.	We abandoned the notion of “phases”, instead we use “period” to describe the variation of the lone-term volcanic output rate of the Milos volcanic field. Therefore, we completely rewote the content of section 4.3.	P13-21 /L499-831
486	given that you do not present any volcanological data, most of the volcanological interpretations of the units should be removed from this section.	We removed most of the volcanological interpretations as McPhie suggested.	P13-21 /L500-832
490-492	Highlighted “one type of volcano was active” and “chemical composition of the volcanic units as an extra distinguishing charateristic” with a comment of “volcanic phases" in figure 15 show any connections or relationship. eg. "phase 4" groups rhyolite and andesite and "phase 2" groups a cryptodome and pumice cone. What you define as "phases" are in fact the dates at which single volcanic centres were active.	We removed the discussion about volcanic phases and quiescence. Instead we discussed the variation of the temporal volcanic output of the Milos VF.	P17-19 /L656-657
495	Highlighted “Most of the time Milos VF was in quiescence” with a comment of “this text comes from my previous review”	Yes, it does. This sentence has been deleted.	P17/L661-662
513	Highlighted a typo of “volcanoclastic”	Corrected as “volcaniclastic”	P13/L514
534-537	Deleted “Submarine eruptions…cryptodome and sills (Stewart and McPhie, 2006).”	This has been deleted.	P18/L700-703
541-542	Highlighted “were probably simultaneously active from 2.66 to 2.62 Ma.” with a comment	This has been deleted.	P18/L707-708

	of "this makes no sense; eruptions last days, weeks, months, years, perhaps decades but definitely not tens of thousands of years"		
548-553	Deleted "These domes form high-aspect ratio deposits with a roughly concentric structure of a coherent core, 30-40 m thick layer which is flow banded and a monomeric breccia (Stewart and McPhie, 2006)." and "which were extruded onto the sea floor or into shallow unconsolidated pumice rich sediments"	Both of them have been deleted.	P18/L755-762
571-573	Deleted "These petrological and geochemical characters of phase 6 indicate the magma mixing in these andesitic-dacitic units, that a mafic magma from the deep crust likely injected into the shallow chamber beneath the Kantato and Korakia domes." with a comment of "you do not present any data to support these interpretations. either omit or cite appropriate references"	This has been modified.	P18-19 /L778-780
575-577	Deleted "These domes structures have the characteristics of subaerial domes with an extent of 2.5-10 km^2 and are maximal 250-350 m thick in the proximal part (Stewart and McPhie, 2006). Single domes have a massive core and flow banded rind surrounded by an in situ autobreccia zone.";"	This has been deleted.	P19/L782-784
584-585	Deleted "The Plakes volcano is probably the last volcano erupting in a submarine environment on Milos, whereas the rhyolitic lavas of Halepa are subaerial (Stewart and McPhie, 2006).";"	Changed to "The Plakes lava dome is probably the last volcano erupting at ~0.97 Ma (Fytikas et al., 1987) in a submarine environment in the north of Milos, whereas the other lava dome in Period III, Halepa, produced rhyolitic lavas in a subaerial setting in the south (Stewart and McPhie, 2006)."	P15/L574-576
590-591	Deleted "The evolution of this complex starts with phreatic eruptions which became less explosive over time (Fytikas et al., 1986). In the last phase rhyolitic lavas filled up the crater area and did breach the northern tuff cone walls."	Changed to "The evolution of this complex starts with phreatic eruptions which became less explosive over time (Fytikas et al., 1986). During the last eruption (0.317 ± 0.004 Ma) of the Trachilas complex rhyolitic pumices filled up the crater area and did breach the northern tuff cone walls."	P15/L579-582
597-599	Deleted "Campos Venuti and Rossi (1996) indicated that the stratigraphic order is: Fyriplaka and Gheraki tuff rings, Fyriplaka lava flow, composed tuff cone of Tsigrado-Provatas. The tuff ring of Fyriplaka was divided into 3 members, with on top the deposits of the Tsigrado tuff cone."	We did not delete this, in order to keep readers informed on the names and structure of the Tsigrado tuff cone.	P15/L588-590
611	Reduce this section to a few sentences. Fig6 shows very clearly that there are no compositional trends with time. Plus you have not presented data in support of the petrological interpretations	We reduced the content of section 4.4 and moved the reduced text into section 4.3.3. Therefore, we removed section 4.4 from the new revised version. Our petrological data is presented in supplementary material I.	P19-20 /L778-802 And P15-16 L605-652

651-658	Deleted the second paragraph of section 4.5 with a comment of “if there are no data, no point in discussing.”	We still kept most of this paragraphy as the last paragraph of the section 4.3.3 in the revised version. This is necessary for this paper to estimate the magma supply rate from deep of the Milos volcanic field.	P16/L639-646
666	conclusions need to be revised after the text has been revised	Conclusion has been revised based on the newest verson of this manuscript.	P20/L834-849
P23	For Table 1, what do these numbers relate to "Angelier_1" etc? what does superscript "e" relate to?	The superscript “e” has been removed.	P27
P26	For Table 4, should give totals of major element oxides. Should have samples across the top and major elements down the side.	Changed accordingly.	P30-31
P27-40	Specific comments for figures and figure captions	Changed accordingly,see revised manuscript with track changes.	P32-51

Response to the specific comments of Jocelyn McPhie for figures.

Figure number	Comment by Jocelyn McPhie	Comment by authors	New Figure number
1	Put this info on figure, “the depth to the Benioff zone from Hayes et al., 2018” and “The GPS-determined plate velcity from Doglioni et al., 2002”, in the caption	Changed accordingly.	1
2	This figure is misleading, especially for the pumice cone volcanoes. What you have shown is the only the approximate centre of areas where the different facies associations have been mapped. There is in fact a lot of overlap and interfingering of different associations. Also, the map implies that the various "volcano" types shown are discrete - they are shown separated by something that isnt actually defined. Any map presented at this stage should support the text.	Changed accordingly by showing the proximal and medial facies of these volcanic centres in Fig. 2.	2
4	typo volcanoe; should be “lava”, not “lava flow”; Most volcanic units actually take at most months to a few years to form, and the rest of the time is repose. So "quiescence" is the norm, "quiescence" is what goes on most of the time. Eruptions are brief (instantaneous) interruptions to that "quiescence". some of the more complex units that have multiple subdivisions probably take longer but certainly not the single domes. It is thus misleading to block out certain intervals as quiescence when almost all the time is	Changed accordingly.	4

	"quiescence". Should remove these labels and explain this situation in the text.		
5	The title, “The basaltic-andesitic dyke of the Mavro Vouni lava”, does not make sense	Changed to “Basaltic-andesitc dyke of the Mavro Vouni dome”	5
10	Missed the Le of the name Le Bas et al. (1986)	Changed to Le Bas et al. (1986)	10
11	This figure is misleading because the data are incomplete - the oldest pyroclastic units in the SW and also the Filakopi Pumice Breccia are pumiceous and the pumice is highly vesicular Because the data are so incomplete, these plots are of little value.	Added more literature data for the pumiceous unit of the Filakopi volcanoes and lava of the Plakes dome; Geochemical, crystallinity and vesicularity data of the old pumices of the Profitis Illias is laking due to severe alteration	11
12	what is the vertical scale? Add a label.	Vertical scale has been removed	11
12	Highlighted “Note the shift to more felsic composition over time” with a comment of “but the oldest units are mainly rhyolitic pyroclastic units”	This sentence has been removed.	11
12	Typo “constaint”	Changed to “constrained”	11
12	Highlighted “Q1-5 are the four periods of volcanic quiescence that lasted more than 200 kyr.” with a comment of “see previous comments - this figure also misrepresents the reality that eruptions are instantaneous. They should not be represented a "phases" between "volcanic quiescence"	This sentence has been removed.	11
13	The superscripts seem to not make any sense. why is this sample of yours (G15M0004) referred to Stewart and McPhie? Miss up “fission track, not K/Ar nor U/Pb” add the info “fission track ages” in caption	Changed accordingly.	12
14A	logs 1 and 4 are not consistent with the other logs; they are not graphic logs whereas all the other ones (copied from Stewart and McPhie) are graphic;	Changed accordingly.	13A
14	Highlighted “(A) old (>1.4 Ma) and (B) young (<1.4 Ma)” with a comment of “seems to be the reverse - A is young and B is old”	Changed accordingly.	13
15	Suggested that “Published data” should be “Published age data”, and “This study” should be “Age data, this study” the legend implies that you attribute the composition and volcano type to this study when in fact, this study has not contributed any new data on volcano types or composition	Changed accordingly However, we added new geochemical data of the Milso volcanic field as shown in Table 4.	14
15	Typo “Intursion”	Deleted	14
15	This figure only makes sense if you remove the "volcanic phases" and remove the "periods of quiescence". Neither the compositions nor eruption styles of the volcanoes grouped in the "volcanic phases" show any connections or relationship. eg. "phase 4" groups rhyolite	The “volocanic phases” and “periods of quiescence” have been removed from this figure. Instead, we used Period I-III to represent the period with different volcanic output rate in long-term timescale.	14

	and andesite and "phase 2" groups a cryptodome and pumice cone.	We also removed the names of the volcanic centres on Milos and gave number 1-21 to represent these names or locations which can be found in the new Table 5 and Fig. 2.	
16	remove "Phase" labels. Replace with measured ages.	This figure has been removed from this manuscript.	Deleted

Referee #2: Jörn-Frederik Wotzlaw
Dear authors and editor,
I have now completed my review of the above-mentioned manuscript. The authors report groundmass, biotite and amphibole $^{40}Ar/^{39}Ar$ geochronological data for tephra deposits and lavas from the Milos volcanic field (MVF) in Greece. The data is used to reconstruct the eruptive history and eruptive flux of the MVF. Geochemical data is used to further track the compositional evolution of this volcanic center.

General comments: The manuscript reports a large amount of high-quality geochronological data and the interpretations are generally justified. Much of the Ar/Ar data is quite complex with complicated release spectra and age distributions. This is discussed in sufficient detail and the reliability of the data is assessed carefully. Considering that 40Ar/39Ar dating of such rather young deposits that lack alkali feldspars is rather difficult, the final interpretation of the data appears to be robust and agrees well with field relationships.

We thank Dr Wotzlaw for his positive comments on our geochronological work.

After reading the other review (which maybe I should not have done), I think I very much agree that the subdivision into different phases and intervals of quiescence is somewhat artificial and doesn't really reflect the eruption dynamics of the MVF. There seem to be "gaps" within some of the "phases" that are as long as the intervals of quiescence (e.g. 0.3 Ma between Mavros Kavoslava dome and Triades dome and 0.3-0.4 Ma between Dhemenegaki and Kontaro). I feel like this subdivision is not really justified based on the data, neither the geochronology nor the geochemical data. The cumulative eruptive volume versus time figure (Fig. 12) is much more revealing and I would say that there are secular variations in eruptive flux and eruption frequency with an early low-flux interval, a short high-flux interval followed by an extended lowflux interval. I find that this represents the dynamics of the MVF more naturally than assigning these artificial "phases".

In this context I would recommend to combine figures 11 and 12 to display the eruptive flux and compositional variations together on the same scale. I think this would be quite illustrative (e.g. it seems like the transition from the high-flux to late low flux interval coincides with a rather sudden change in magma composition, crystal content etc. This has some important petrological implications and reveals some important change in the magma plumbing system from producing crystal-rich (20-40%) intermediate eruptions to crystal-poor (<5%) rhyolitic magmas that represent the extracted residual liquids. Describing and discussing this in detail in a short paragraph on the petrologic implication I think would be very interesting.

We do agree with Dr. Wotzlaw (and reviewer #1: Dr. McPhie) that this part of the paper needs to be improved. We have followed the suggestion of Dr. Wotzlaw to improve Figure 12 and incorporate 3 periods (or intervals) of low/high flux (Q_e) and we combined Figure 12 with 11 (see revised manuscript below). We have rewritten section 4.3 to remove the "phases" and base the discussion of the volcano type and composition on the three periods with different fluxes.

Figures: There seem to be significant differences in effort that went into the different figures and some are a bit repetitive and not necessary, Fig. 5-8 look like supplementary figures that I think need some editing to make them even useful. The Ar release spectra are alright but they are many and in many cases are shown as individual samples and as combines spectra. Maybe it would be more useful to have larger panels only with the combined data and move the individual ones into the supplementary material. It would just make things less messy. Similarly, the ranked age plots for total fusion analyses have loads of text in each panel but the scaling of the axes is so stretched out, that it is difficult to assess the dispersion of the data. As mentioned above, Fig. 11 and 12 could be combined but need some general editing. I don't think Fig 13 is necessary and could be deleted or moved to the supplementary material. Fig. 15 is a bit of a mess and I don't find that this figure is doing the amount of new high-quality data justice. A better-quality summary figure that integrates all the new and published
data would sum up this work nicely for any reader.

We agree with Dr. Wotzlaw. The individual age spectra of Figure 5-9 have been transferred to the supplementary material. We only present the combined spectra and final age calculations in Figure 5-9. We have modified the x- and y-axis of the total fusion analyses (Fig. 7) so these are consistent, as suggested by Dr Wotzlaw. We also agree with Dr Wotzlaw that Figure 11 and 12 can be combined. Figure 13 is an important figure for this manuscript because it shows that some of the older age data are different compared to our results for the same volcanic units and this is discussed in section 4.1. This diagram also shows the smaller uncertainties on the age data we report compared to some of the previously published data. We have modified Figure 15 to incorporate the three periods with different fluxes (see the revised manuscript), and combined published age data for Milos with our new $^{40}Ar/^{39}Ar$ ages.

In summary, this manuscript reports abundant high-quality data for the Milos Volcanic Field that significantly improves the temporal calibration of this volcanic center. I think it needs some revisions especially regarding the eruption dynamics and relationship with compositional variations. A paragraph on the petrologic implications would make this more interesting for a wider magmatic petrology community. Ultimately, I recommend publication of this interesting manuscript in Geochronology after some moderate revision.
I hope the authors find my comments useful and that they will improve the paper.

We thank Dr Wotzlaw for his constructive suggestion