Dear Dr. Devitre,  
  
I write you in regards to manuscript # JPET-Nov-23-0174 entitled "Depths in a day - A new era of rapid-response Raman-based barometry using fluid inclusions" which you submitted to the Journal of Petrology.  
  
In view of the criticisms of the Editor/reviewer(s) found at the bottom of this letter, regrettably your manuscript cannot be accepted for publication in the Journal of Petrology.  
  
Thank you for considering the Journal of Petrology for the publication of your research.  I hope the outcome of this specific submission will not discourage you from the submission of future manuscripts.  
  
Yours sincerely,  
  
Prof. Georg Zellmer  
Editor in Chief, Journal of Petrology  
[G.F.Zellmer@massey.ac.nz](mailto:G.F.Zellmer@massey.ac.nz)  
  
  
Editor Comments to Author:  
  
Editor: Humphreys, Madeleine  
Comments to the Author:  
Dear Dr Devitre  
I have received two helpful reviews of your manuscript. Although understanding the importance of the barometry in volcano monitoring, the reviewers raise issues around the presence of H2O in the fluid in determining pressure, and the need for careful understanding of temperature. Although these factors may be well understood at Kilauea, it makes wider application of a ‘rapid response’ method more problematic given the need for additional analysis. Overall, the study might be better suited to a volcanological journal and one where you have additional space to discuss some of the complexities of analysis and interpretation. I am therefore making an editorial recommendation to reject.  
With best regards  
Madeleine

We thank the editor for the handling of our manuscript. However, we respectfully disagree with the decision and would like to ask that our manuscript be reconsidered. Given that the current word-count (1700 words) is well below the allowance for letters in Journal of Petrology (4000 words) and 2 additional figures can be added as well, we think that some of the reviewers’ concerns can easily be addressed. The two main concerns raised by the reviewers based upon which the editorial decision was made were temperature determinations and the likely presence of H2O in the fluid. We have done our best to address relevant concerns and hope that the journal will reconsider the decision to reject. On the issue of H2O, DiadFit now includes the option to use a mixed H2O-CO2 equation of state and perform relevant pressure corrections based on expected H2O mol% in the fluid. Although H2O mol% in the fluid can be a difficult parameter to constrain directly, it is possible to do so if a melt inclusion dataset exists for the volcano, where XH2O can be calculated from a solubility model such as MagmaSat (DeVitre et al., GPL in press). H2O in the fluid phase can sometimes be measured (if it has not diffused or reacted) as Dr. Berkesi mentioned, however in many cases H2O is no longer present in the fluid phase. In such cases, a correction can be done by estimating XH2O in the fluid phase, for example using a preexisting Melt inclusion dataset. We note that even older melt inclusion datasets (prior to the consideration of CO2 in vapor bubbles) could be used to constrain this parameter at a specific volcano (not considering the bubble CO2 only means that the XH2O will be overestimated such that the correction would be an absolute worst-case scenario).

Regarding temperature, we emphasize that precise control of the entrapment temperature is unnecessary. We have included a new figure showing the lack of sensitivity of the method to temperature when at magmatic temperature and added some additional calculations with larger temperature errors. In DiadFit, this can easily be modelled in the Montecarlo simulations (which we have done): note that even a 100K error on temperature has a very small effect on the measurement error. Therefore, we do not consider this concern to be valid. This method does not require very precise constraints on temperature. The purpose of doing this exercise at Kīlauea was to demonstrate its speed and validity in the context of a well-understood volcanic system, where the stakes were relatively low.

Finally, there are numerous extremely active systems in the world where this method can be used. In fact, some of the most actively erupting volcanoes in the world are basaltic volcanoes, not arc volcanoes. For example, this method would be valid and useful for monitoring of Icelandic volcanoes (currently erupting), Hawaiian volcanoes, Canary Islands, Azores, Fogo, Reunion Island, just to mention a few. While there are difficulties for arc volcanoes, we do not claim this method will be of use at present time at arcs. However, no method is useful in every tectonic setting in the world – therefore we do not agree that this makes this method too localized or not of broad enough use. We have added a section in the main text for global H2O estimates at relevant locations and hope that this discussion will satisfy the concerns raised by the reviewers.   
  
  
Reviewer Comments to Author:  
  
Reviewer: 1  
  
Comments to the Author  
The paper reports quick analysis of CO2 fluid inclusions by Raman spectroscopy to determine their density and pressure of entrapment in olivine for recent eruption of Kilauea. The main conclusion is that the analysis can be done relatively quickly (in 1-2 days) compared to usual time range of petrologic studies and therefore the results are valuable for near real-time petrological monitoring of active volcanoes.  
The paper is written clearly and the results are technically correct. I am however not supportive of this publication in Journal of Petrology because of several reasons, mainly because of limited scientific value of the quick data. I recommend to publish these results in more specialized journal like Bulletin Volcanology or similar.

We thank the reviewer for the appreciation of the quality of the data and manuscript; however, we respectfully disagree with the conclusion that there is limited value to the speed of the method. There are currently no petrological methods available that are capable to produce magma storage depth data within a single day of analyses – this is important because it is a timeframe that is relevant to observatories monitoring eruptions and provides a secondary independent check for geophysical data (which currently has no other validation than itself).   
1) The methodological approach is well known. It does not even require high-resolution Raman spectrometer (=expensive instrument), it can be done with high precision using optical freezing-heating stage to record homogenization temperature of fluid inclusions. If the authors believe that joint well-coordinated work of small group of people is real innovation, I disagree with this. Even if the group can work in such regime during a week or month (can it?), this will not be scientific result.

We agree that the use of fluid inclusions to assess magma storage depths is not a new method per-se as it has been used in deep storage systems in the past via microthermometry (we assess the reliability of the method in our paper in press at GPL, available as a preprint and cited here as DeVitre and Wieser, 2023). However, we disagree that microthermometry can access this information in every case. Microthermometry is indeed very easy to conduct when the density of CO2 is above critical (where the vapor homogenizes into the liquid) but is extremely difficult to conduct in volcanic inclusions not hosted in quartz when the density is below critical, and the liquid homogenizes to vapor. This phase change is significantly more difficult to constrain and frankly impossible except for large inclusions hosted in clear minerals such as quartz. This is well documented in numerous previous publications such as Hansteen and Klugel (2008). This means that pre-eruptive storage will only be constrained if it is happening at more than 7-8 km depth (in the case of Hawaiian volcanoes like Kilauea and Mauna Loa, all pre-eruptive storage is shallower than this). Microthermometry also requires the preparation of double-polished wafers, making preparation much slower than for Raman. Concerning the sustainability of the analyses, we do not think that is a valid concern, part of what we have demonstrated is that this work can be done without “extraordinary” circumstances (no teaching or class releases, no overnight shift work, etc). We do not believe or advance that well-coordinated work is real innovation - we simply demonstrate and highlight the feasibility of using this method as a near- real time monitoring petrological tool to determine magma storage depths. This is relevant because magma storage depth has been identified as high-value information for observatories (Re et al., 2021) but no petrological methods were able to access it on timescales relevant to eruptive crises.

2) The real value of the quick data is not demonstrated. What happens is the data is obtained later, in a week or two? Or in a year? And by that time will be supported with other geochemical data, melt inclusions, olivine mapping etc.? I think the scientific value of the data will increase significantly.

We respectfully completely disagree with this statement. The value of quick data is to inform monitoring efforts and the decision-making related to those monitoring efforts. Observatories need real-time information, for example to assess whether populations should be evacuated. A sudden change in magma storage depth information can be a critical piece of information to understand an ongoing eruption. Magma storage depths have been identified by observatories (Re at al. 2021) as an extremely valuable piece of information in monitoring, but this is typically not a quickly produced type of information. There is no monitoring value to data produced a year later when an eruption has ended. At that point such data only informs models for “future eruption expectations”.

3) The method requires good knowledge of temperature to calculate pressure using EOS for CO2 fluid. The dependence of temperature vs. olivine Fo-number is probably well known for Kilauea. However, it is necessary to demonstrate its long-term validity. Anyway, quantitative analysis of olivine (=access to microprobe) is required. The temperature determination will be more problematic for less studied volcanoes and for more evolved magmas without olivine, which could experience more complex crystallization path.

We respectfully disagree with the reviewer. We have included a plot showing how little the sensitivity of this method is to a “precise” temperature constraint. In fact, even a 150K error on temperature (essentially encompassing the entire range of measured temperatures for olivine saturated liquids ever erupted and measured at Kilauea) would matter very little (e.g., ±0.5 km at 4km and ± 0.2 km at 1.5 km, no more than 20% difference) and is easy to model using our method via Monte Carlo simulations. Access to a microprobe is unnecessary – SEM EDS measurements are sufficiently quantitative for application of this method as we show in this letter.  
4) The method is hardly applied to magmas containing significant amounts of H2O because the fluid will be mixed H2O-CO2 fluid at low pressure and thus the pressure estimated from data on pure CO2 fluid will be the lowermost estimate. Thus, the method is difficult to apply for monitoring subduction-related volcanoes, which are often highly explosive and represent real danger for people. In addition, collection of real time-series samples from explosive volcanoes in their active phase maybe very problematic.

We agree with the reviewer that the method is not suited to arc volcanoes – however we do not claim that it is. DiadFit now includes a mixed H2O-CO2 equation of state and corrections for the likely presence of H2O can be made. We have corrected our data based on estimates of XH2O for Kilauea from MI data (DeVitre and Wieser, 2023). The XH2O in the fluid can be estimated from MI data (when available), and because analysis of vapor bubbles would only reduce the XH2O estimated from a solubility model, older melt Inclusion data can be used to assess a “worst-case” scenario. H2O can also be measured -if it is still present as reviewer #2 mentioned (though it rarely is) – using Raman spectroscopy. We do not claim that this method is currently applicable to arc volcanoes – but not every method is applicable to every scenario. Most volcanoes on Earth are basaltic volcanoes, and numerous highly active volcanoes that do pose serious health and safety hazard to nearby populations are volcanoes for which our method is applicable and relevant (for example East African Rift, Iceland, Hawaii, Azores, Fogo in Cabo Verde, Canary Islands, Reunion Island just to mention a few). Many of these also have a history of explosive volcanism (including basaltic Plinian and sub-plinian eruptions). As for collection of real time-series samples, we do not think this is truly a valid concern as such sample collections are done in many places in the world using buckets, or even collecting on surfaces of solar panels (like during the very dangerous explosive events of Turrialba volcano in 2016-2017).

To consider this comment, we’ve included a compilation of XH2O for different volcanoes and plotted this in Fig 4. We have also added a small discussion of these at the end. Still need this.

5) Finally, I doubt that Raman analysis of fluid inclusions is more effective and precise approach than analysis of melt inclusions. Fluid inclusions are often very rare and search for them takes long time. Melt inclusions can be abundant and prepared for H2O and CO2 analysis very quickly by experienced personal. Anyway, no matter fluid or melt inclusions, there is still question what do tell us the estimated pressures?  Are these pressures of magma storage depth, or the inclusions were trapped on the way to surface?  What does mean the range of pressures estimated? How the data can be used by decision makers?  
As two experienced melt-inclusion analysts, we respectfully disagree with this statement. Melt inclusion analysis, no matter the experience of the user, is a very slow and expensive method. It is impossible to prepare and analyze as many melt inclusions (for example 16 in one day) as fluid inclusions and obtain magma storage depths. At minimum, Melt inclusion analysis requires constraining CO2 in the vapor bubbles using Raman spectroscopy or re-homogenization experiments (forward modelling is simply not good enough at this time), CO2 and H2O in the glass via FTIR or SIMS (if FTIR it requires double-polished wafers of the MI) as well as glass and host chemistry via electron microprobe followed by PEC corrections, total CO2 reconstructions, and solubility model calculations. It does not matter the experience of the melt inclusionist – it is impossible to conduct meaningful melt inclusion analysis in a timeframe even remotely comparable to fluid inclusion analysis.

In terms of precision and accuracy of measurements of FI vs MI, we also disagree. Suffice to looks at error analysis in Tucker et al., 2019; Hanyu et al., 2019, DeVitre et al., 2023 and Wieser et al., 2021 🡪 errors on melt inclusion analysis are frequently 20-50% or more; again, this is enormous compared to the precision of fluid inclusion analysis (even with T errors of >50-100K). We show the reliability of fluid inclusion analysis compared directly to melt inclusion analysis in our in press paper (DeVitre et al., GPL in press) which we referenced as a preprint in this publication.

As for the last three questions: “What do the pressures tell us? Storage or trapped upon ascent?”. It has been shown extensively that FI tend to record stages of equilibration such as stalling and storage events (Hansteen and Klugel, others) and that clustering of pressures is indicative of such regions. It is possible that some of the inclusions could be trapped upon ascent (for example those that are very shallow and contain SO2) – but this would likely only be inclusions very close to the edge of crystals, or in secondary fractures that traverse the entire crystal as the crystals would have very little time for growth and annealing – these can generally be removed from the dataset (we filtered as possible). We note that FI and MI at Kilaeua record the same pressures (DeVitre and Wieser, GPL in press) within error of the methods, and that the depths estimated from our FI method are consistent not only with the MI data but also geophysical estimates of magma storage at Kīlauea – therefore we consider that this the most likely petrogenetic history that they are recording.

As for the range of pressures recorded, there are two main interpretations (aside from some of the distribution being explained by the uncertainty of the method): one is that re-equilibration of fluid inclusions between the 3-5 km reservoir and 1-2 km causes a distribution of pressures – however our re-equilibration models at Kīlauea (DeVitre and Wieser, GPL in press) indicate that re-equilibration is not of concern and that even a stalling event of ~2years prior to eruption would result in <10 % difference in the pressure (this is less than the uncertainty of the method). Magma storage systems are not perfectly uniform molten magma chambers at a precise depth– rather they are mush systems, as such, it isn’t inconceivable that pressure and temperature are not uniform either, hence that FI trapped in crystals at slightly different locations in the system would have slightly different pressures. Random sampling of this system and a lack of significant re-equilibration could explain such a distribution. Clustering between 1-2km would simply indicate this is the predominant region of equilibration which we interpret as magma storage. Details of the method are discussed extensively in our GPL paper and are beyond the scope of this article.

[I’ve taken this from the cover letter, it can be tweaked] The results presented in this letter are the first demonstration that petrologically derived magma storage depths can become part of an observatory’s toolbox, with implications extending well beyond the academic sphere and bearing a direct impact on people's lives. Observatories having more information upon which to make informed operational decisions will directly impact the lives and livelihoods of individuals residing near active volcanoes, such as those surrounding Kīlauea volcano in Hawai‘i. Information can also bring comfort during volcanic events – for instance, during the devastating 2018 Lower East Rift eruption, Hawai‘i Island residents routinely asked questions related to the source of the erupting magmas and were expecting answers from the Hawaiian Volcano Observatory (HVO). We anticipate that near-real time Raman analyses of fluid inclusions will be used during future Hawaiian eruptions in concert with HVO’s current bulk rock XRF chemical monitoring routines. This will allow information about melt properties such as viscosity and temperature to be specifically tied to the reservoir supplying the melt. Time-series analyses of fluid inclusions would be particularly powerful for identifying a switch to a different magma supply. This fluid inclusion method can be applied to many hazardous and frequently erupting volcanoes worldwide (e.g., those in the Galápagos, Réunion, Azores, Canary Islands, Iceland, Cabo Verde), either through the development of in-house Raman facilities, or collaboration with academic institutions. This is particularly true given that resources required are modest, both from the perspective of instrumentation and personnel-hours. Making this method available to the community in a timely manner is particularly important in the present context, with the continued unrest and inflation at Kīlauea and the escalating activity in Iceland.

Taking all the comments together, I doubt that the contribution has sufficient scientific value for publication in Journal of Petrology. It may however have value for volcano monitoring. This needs to be demonstrated by doing this work over some time, not necessarily with the same intensity as in the reported case.  More specialized volcanological journal would be more appropriate place for this publication.  
Well yes, it is the whole point, that it has value as a petrological method for volcanic monitoring. I fail to see how this is not important enough. We already proved the reliability of the method with our GPL paper. We respectfully disagree with the reviewer on their conclusions. We have done careful work comparing microthermometry and Raman, and MI and FI pressures at Kilauea which is reported in our paper in press at GPL (cited as preprint here, DeVitre and Wieser, GPL in press). This proved the reliability of the method. The purpose of this study in turn was to show its viability as a rapid petrology monitoring tool – which we think has been accomplished as well.   
  
Reviewer: 2  
  
Comments to the Author  
Review on  
  
DeVitre et al Depths in a day - A new era of rapid-response Raman-based barometry using fluid inclusions.  
  
DeVitre and coworkers provide a time-efficient tool to get an estimation for the pressure and temperature of origin for the olivines in tephra related to the 10 September 2023 Kilauea eruption. I am a fluid inclusionist and hence I fully agree with the effectiveness and significance of inclusion studies as it is highlighted in this manuscript. I have also experienced in many cases the wide spectrum of the applicability of melt and fluid inclusion studies. However, a careful investigation is a must that does not help the time efficiency the authors point out here.  
We thank the reviewer for their appreciation of our method and results.

I have therefore several comments/concerns about the results, the results and implications about the study.  
  
1) The exact compositions of the fluid inclusions. The authors clearly state that out of the CO2, minor SO2 (less than 5 mol%) has also been detected at the temperature of analyses (around 40 °C).  However, especially in the case of low-density fluid like in this study, a careful investigation should be made by Raman spectroscopy to look all the potential fluid molecules that can be present in volcanic gases, like: N2 (taking care of air contamination), H2S, CH4, CO; most importantly H2O. For this latter case, to detect the water, a heating experiment at around 150 °C can be a useful approach (Please see Berkesi et al., 2009, Journal of Raman spectroscopy, <https://doi.org/10.1002/jrs.2440>), as at lower temperatures, small amount of H2O can remain undetected in fluid inclusions.

We agree with the reviewer that other fluid can be present in fluid inclusions, especially at shallow depths and that FI should be monitored for this. Via Raman spectroscopy, we did not observe any other gases than the ones mentioned (CO2 and occasional small amounts of SO2). N2, CH4, CO and H2S were not observed in any inclusions. This can easily be systematically monitored during analysis by collecting a broad raman spectrum encompassing all the regions needed to identify such gases (many of which have higher interaction coefficients than CO2, making small amounts easier to detect than CO2 even with short acquisition times). H2O can indeed be an important fluid. There are two approaches: one as the reviewer mentioned is to measure the FI while heatingat around 150C but the caveat is that in many cases the H2O may have difused out or reacted such that the left over fluid does not contain any H2O anymore. The other approach (Hansteen and Klugel, 2008) is to correct for H2O, considering a XH2O in the fluid and using a mixed CO2-H2O equation of state. DiadFit now has the capabilities to perform this H2O correction. In many cases this XH2O can be approximated using a solubility model and any existing MI data for the volcano – even if it is glass only MI data (this will provide a worst-case scenario) (DeVitre and Wieser, GPL in press). We now correct the FI presented here considering this. We emphasize that this method is not proposed for use in arc settings where XH2O could be very high.

2) In agreement with the previous point, I recommend the authors to add (at least to the supplementary) representative Raman spectra of the fluid inclusions analyzed. This would be very helpful to convince the reader about the fluid composition. Composition of the fluid, therefore, is crucial to check whether the distance of the Fermi diad on the CO2 Raman spectra can be applied to density-pressure-depth estimation. Given that the CO2 densimeters are calibrated to pure CO2 system, a careful investigation must be made as the components beside CO2 can modify the results on depth estimation as well. Please add more details on this subject to the manuscript.  I was also wondering why the author did no use Raman CO2 densimeters like the Fall et al., 2010 GCA (<https://doi.org/10.1016/j.gca.2010.11.021>), or Remigi et al., 2022 JRS (<https://doi.org/10.1177/000370282098760>)?

All raw spectra of our FI are available in the data repository. Because we already conducted an in-depth analysis of FI at Kilaeua (DeVitre and Wieser, GPL in press), and surveyed the Raman spectrum for presence of other species, we are confident that the only species present in this case are CO2, <10% H2O, and rare small amounts of SO2. We agree that it is important to consider this however – and therefore include a more detailed discussion of the importance of surveying for other fluid species while conducting these analyses. We correct pressures using DIadFit for the likely presence of H2O (although it was not detected in the FI) based on the XH2O estimated from MI data at Kilaeua. Concerning why we did not use Fall or Remigi, this is because the use of literature densimeters calibrated on different instruments than our own is inappropriate (LaMadrid et al., 2017; DeVitre et al., 2021; Devitre et al., 2023) and alone can account for errors on measured densities of up to 0.15 g/cm3 (catastrophic). Therefore , we built our own densimeter calibration at UC Berkeley using an apparatus of the same construction as DeVitre et al., 2021. This calibration is specific to our instrument and a comparison of densities measured by microthermometry and our Raman (they are within 5% of each other) is presented in DeVitre and Wieser, GPL in press.  
3) The temperature was used for crossing the CO2 isochors. The authors state that 1150 C was set as temperature of entrapment of the inclusions. Please provide more details to convince the readers why did you chose such a value?

We now provide more details on the choice of temperature, however we note that this is based on chemistry of Kilauean magmas and geothermometric data from past eruptions like 2018 LERZ which in general indicate that 1150~ is a reasonable ballpark (DeVitre and Wieser,2023). “assuming an entrapment temperature of 1150 ˚C, based on geothermometric estimates of erupted liquids for previous events such as the 2018 LERZ eruption (Gansecki *et al.*, 2019). We highlight that this method is relatively insensitive to large temperature uncertainties (±150 K, Fig. 1a-b). Even if we consider the entire range of measured temperatures from olivine-saturated liquids erupted in the history of Kīlauea volcano (~1100–1350 ˚C), the resulting pressure and depth difference is no larger than 20% (Fig. 1c). At pressures relevant for Kīlauea magma storage, this corresponds to a 1σ uncertainty on measured depths smaller than 0.5 km (Fig. 1b). Given that the maximum range of measured temperatures in our final dataset is only ~125 K (1182–1307 ˚C), this means that the pressure difference induced by our first assumption of 1150 ˚C is at most 13% in the worst case scenario and less than 8% when compared to the mean measured temperature (~1240 ˚C, Fig. 1c).”

The temperatures were refined after olivine analyses.   
4) The quality of petrography images is poor, especially the optical microscopy images. Based on my experiences the routinely used microscopes provide better images than what the author show here(etc the Nikon OptiPhot2 optical microscope equipped with a Nikon CoolPix DS-Fi1 camera). Normally, we use a special condenser that is perfect for inclusion-seeking. For image quality, for example, please see figure 1 in Guzmics et al., 2019, <https://doi.org/10.1130/G46125.1>)  I don’t see the reason why you didn’t use such a properly working, routinely used optical microscopes equipped with a suitable camera instead of your smartphone-assisted technique?

We own high-quality microscopes and cameras for fluid inclusion analysis – however the purpose of the images attached was not to provide high-quality optical microscopy images of the FI but rather to navigate on our instruments for analysis (Raman and SEM). The reason we present these images is to show that to find the inclusions on the Raman and SEM (after they have been selected for analysis), high-quality microphotographs are not necessary. The reason this is relevant is because petrography microscopes and cellphone cameras are much more accessible economically. All detailed images of the fluid inclusions are provided in the data repository. The images in the supplement were simply examples of how we can navigate on our instruments without needing such high-quality images.   
5) There are some images where I can clearly see that the inclusions are primary (I think of the clearly isolated or randomly distributed inclusions). This is crucial for the implication. There are however inclusions where I see inclusions trapped along a fracture. Are these inclusions secondary or pseudosecondary? The pictures must clearly indicate this information, as in my view secondary inclusions should be avoided in this study.

We’ve included an extra set of images showing details of emplacement. We agree that it is relevant information.   
6) Despite their low quality, what is clearly seen on the petrography images (transmitted light mode, focusing on inclusion) is that there are melt and fluid inclusions co-entrapped in the olivines. The melt inclusions seem to be glassy containing a bubble phase, the fluid inclusion -as confirmed by Raman spectroscopy by the authors – are vapor-rich ones. May the data of pressure and temperature provide the exsolution of fluid phase from the melt in the magma chamber? Can this “bubbling” process of the magma be related to the eruption somehow? Please discuss it.

I’m not sure I understand the point here. Certainly, some of the melt inclusions are likely to be co-entrapped (having already exsolved a fluid phase from the melt and co-entrapped both melt and exsolved fluid) but the majority will have formed bubble via skrinkage (as discussed in Wieser et al., 2021 for LERZ 2018 eruption). Since CO2 starts exsolving very early and deep in magmatic systems, the pressure and temperature recorded by the FI will not be that of first exsolution. Therefore, I do not think that there is meaningful information that can be related directly to the eruption in this case.

There are some issues raised here, but I believe that once the authors clarify convincingly these above points then the manuscript can be accepted. For this, a major revision is needed in my opinion.  
I have attached the annotated pdf of the main text including some minor comments  
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Márta Berkesi