

1. Although this study makes a significant contribution to the understanding of reference station conditions for rock sites in the broadband and accelerometric networks of the National Observatory of Athens, it is important to acknowledge a key limitation.

→ We are glad that our work instigated interest by members of the broader community, and would like to take the opportunity to clarify some misconceptions in what follows. Most of the points labelled as shortcomings or limitations in this commentary are according to our rationale some of the notions that lend our paper its strength, necessity and timeliness.

2a. The study relies heavily on existing data from publicly available sources and past studies

→ No previous study has ever brought together ad hoc all existing information for the stations of the HL network, the only network spanning the entire national territory of Greece and comprising both broadband and strong-motion stations. Compiling the information is the first necessary step towards effectively assessing it and improving its current understanding and use. The importance of comparing and scrutinizing publicly available sources is well in line with current FAIR principles governing data sharing in Europe, and endorsed and promoted by European entities such as EFEHR. This process promotes assessment of the data quality and value, ultimately benefiting transparency and usability/reusability, helping improve the quality of future studies.

2b. and the selection of stations is based on the belief that they are situated on rocks.

→ The very essence of this work is to closely scrutinise and challenge any established beliefs as to the adequacy of the reference conditions that may have been hitherto presumed based on simplified criteria such as broad geological descriptions. The stations likely to be used as reference are precisely those for which the belief exists that they lie on rock, and those are the ones we feel it is most urgent to examine. We could easily have included accelerometric stations that are thought to lie on alluvia, but there is absolutely no reason to fear that any cognizant scientist would choose them as reference stations. Finally, we should clarify that the notion of 'belief' is not based on one source, but is inclusive: we scan all available sources (ESM, accelnet website, publications) and if even one of them makes mention to rock then we select and study said station.

3. This report exhibits several notable shortcomings that may impact the validity and reliability of the findings. First, the reliance on an established belief that the selected stations are situated on the rock without conducting prior site effect studies raises concerns about the accuracy of the assumed geological conditions.

→ Precisely because there exist no prior site effects studies for the HL network as a whole, this is the first time a site effects study is performed in this paper. We do this by means of constructing a curated, high-quality strong-motion dataset and analyzing amplification with the non-reference method of HVSR.

We have no concerns as to the accuracy of the assumed geological conditions: on the contrary, we openly challenge any assumptions by confronting them with what the recorded data show, allowing for the first time the data -dozens or hundreds of recordings per station- to do the talking. See also reply to point 2b.

4. Additionally, the absence of ad hoc field campaigns for characterizing the stations, except in two cases, introduces a significant limitation in understanding geological units and age, as well as other critical characteristics.

→ It is precisely because we do not have access to the very large resources one would need to characterize each and every station in situ –especially considering the geographical distribution and challenging geomorphology of Greece, including many distant islands and remote regions-, that we see evident value in making use of the freely available seismic data recorded over the past two decades. While the exhaustive field campaigns proposed in CC1 would essentially require a new and large nationwide investment in terms of time, personnel and funding, our approach has actually just made use of an old, yet still large, investment that was already made in our country, namely the instrumentation and network operation, and which had essentially been waiting in the proverbial drawer all this time. In our mind, it would be unimaginable *not* to take the opportunity to do this work. Moreover, we would like to clarify that seismic-data-derived analyses are not just the poor man's (or woman's!) alternative to the proposed in-situ characterisation methods: on the contrary, all methods have their limitations. Site campaigns are very welcome when the resources exist for them, but empirical spectral ratios -in the various ways in which they are used here- can sometimes even yield further information, simply because they are unhindered by certain assumptions inherent in campaigns. For instance, here we allow the data itself to indicate any directional dependence of the site response by analysing amplification for rotational increments: this allows for potential 2D/3D phenomena to become manifest. On the contrary, standard geophysical campaigns would yield a preferred 1D profile (the most probable one among a suite of possible solutions), based on which

forward modeling would compute a 1D transfer function that would in turn afford no indication of directionality.

Finally, we should clarify that, in our view, in-situ campaigns could not possibly allow for any further understanding in the geological units or age per se (we are unsure what other 'critical characteristics' our commenter has in mind), since they would focus on wave propagation-related properties, namely velocities, and in an ideal world perhaps damping. What could indeed help improve our understanding of geological units and age could be the drilling of boreholes at all network stations, as is the case e.g. for the kik-net; but this would constitute an even larger nationwide investment, one that we can certainly wish for but are not prepared to wait for.

5. The use of ad-hoc information from maps and operator experience while attempting to enhance site descriptions may introduce subjective biases and lack the rigor of systematic field studies.

→ On operator experience: Information coming from the only specialised personnel to ever visit the station on behalf of the operator may be 'subjective' in that it comes from a human being, but we consider it as lying much closer to expert opinion than to bias. We'd also like to point out that the idea of retrieving and preserving first-hand field information gathered from the operator's side was also proposed by us within the Engineering Seismology CRG of the ongoing AdriaArray project and was endorsed as a practice to be encouraged and systematically applied throughout its hundreds of stations.

On maps: Information coming from maps may conceivably carry the subjectivity of the respective specialists who were employed by the competent national authority to make the map (a risk we are prepared to take, given that any data ever compiled may be blamed in the same way following such a trail of thought), and the bias of scale and of decades gone by since the mapping (a bias that is more likely, in our opinion): but this is precisely the reason why we carefully seek out that information, document it, and then confront it with all other data types we could find. This practice actually minimizes the impact of any single bias by considering all possible data, accounting essentially for epistemic uncertainty. A systematic field study, even if it were possible, would after all carry its own biases and uncertainties.

6. Furthermore, the report acknowledges the absence of previous site effect studies for the ensemble of stations under investigation, suggesting a potential gap in foundational understanding.

→ We suggest there exists a definite gap in site effects knowledge, and we proceed to partially rectify that. We do not know what is meant by 'foundational understanding' or gap thereof.

7. The reliance on publicly available data and compilation of existing information may lead to incomplete or outdated datasets, compromising the overall robustness of the analysis.

→ We believe that scrutinising and compiling data can only help towards more complete and updated information and cannot pose any kind of threat to any analysis.

8. The report's recommendation of preferred reference sites is contingent on the assumptions and methodologies employed, raising questions regarding the generalizability and applicability of the findings to broader hazard applications.

→ Our recommendations, as is the case with any conclusion of any work, are indeed contingent upon our assumptions and methods – were they not so, they could be criticised as being arbitrary or unjustified. The method we proposed is in itself simple and easily generalisable to any region or network, since no assumption has been made that limits applicability to Greece or the HL. The data processing itself has been performed precisely in the spirit of engineering seismology and hazard applications, following upon the footsteps of the PEER framework, which the main author helped shape.

9. Overall, these limitations underscore the need for a more comprehensive and rigorous approach to ensure the credibility of a report's conclusions. While the article compensates by combining available information, including operator experience and ad-hoc data, it highlights a potential gap in the comprehensive understanding of the geological and site-specific features of these stations. Future research could benefit from targeted field campaigns to fill this gap, enhance the robustness of the findings, and provide a more accurate assessment of the suitability of the stations as reference sites.

→ We only partially understand this paragraph. We can only wish that in future there may be large, targeted and systematic investments in in-situ characterisation, including both intrusive and nonintrusive techniques. In the meantime, between awaiting potential new investments and doing something now to capitalise on existing ones, we opt for the latter.

10. It should not be accepted as a research article than a report in such a highly acknowledged journal such as Natural Hazards and Earth System Sciences.