

Interactive comment on “Reassessing the lithosphere: SeisDARE, an open access seismic data repository” by Irene DeFelipe et al.

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Our responses to the reviewer’s comments are indicated after each question (in « »).

GENERAL COMMENTS In manuscript essd-2020-208 the authors present a database (SeisDARE) with data of controlled source seismic experiments. Currently, the database contains 19 datasets, most of them covering the Iberian Peninsula and Morocco; it is open for more datasets. The data itself are stored in and accessible at CSIC’s GEO3BCN database. Each dataset consists of the metadata and the data in standard format (file-based, i.e. SEG-Y). A DOI is attached to each dataset. The metadata of each data set (including authors/creators, title, characteristics, data examples, references and funding information) is visualized as “landing pages” in the

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web-browser and so-called index cards (human readable); it can also be accessed in different (machine-readable) formats. I congratulate the authors for putting together this nice collection of seismic datasets, to preserve them and to make them public for further use following the FAIR idea. The datasets provide a unique opportunity to get insights into the deeper structure of the Iberian Peninsula/Morocco and the processes involved in forming them. Crustal scale seismic profiles are usually very expensive and cannot easily be reproduced. So, keeping and distributing the datasets in this structured way is of high value and is highly interesting for future research (and potentially other purposes). The article is a good way to support the publication of the datasets. The article is logically structured and reads very easy. References for the individual datasets seem complete (see also one of the issues below). I have found only very few typos (see below). The figures are informative and of high quality as is the whole manuscript. A discussion of the accuracy, calibration, processing, etc. are not in detail given in the article, but references have been made to the original articles (in which these aspects should be presented). So I think the topic is extremely well suited to be presented in ESSD I found some issues which I feel the authors should address before the manuscript is eventually ready for publication (moderate revision).

«We really appreciate the interest shown by the reviewer in our manuscript and the recommendation for publication. We also thank the pertinent comments addressed by the reviewer. Therefore, we will resubmit a new version of the manuscript taking into consideration their suggestions, which greatly improve the original version.»

SPECIFIC COMMENTS: - The technical details describing the archived data should be somewhat extended (it seems that the majority of the metadata is to large extend related to the bibliographical data such as authors, title etc.). Actually this is an issue for both the repository and the article. Most of the data (I have checked a few) are stored in SEG-Y format, which is a standard exchange format, however, I suggest to add (in addition to the existing reference/link to SEG) a reference to e.g. Barry, K.M.; Cavers, D.A.; Kneale, C.W. (1975): Recommended standards for digital tape

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formats. Geophysics 40 (2): 344– 352). Other datasets are stored in seismic unix (su) format and I think a link or at least a short description or statement regarding this de facto standard format should be added to the article (e.g., <https://wiki.seismic-unix.org/doku.php>, but there might be better references). In line 120 it says that "Data are mainly in SEG-Y format...". Since datasets in su format is also found, could you be more complete and specific? Is there a policy of the GEO3BCN repository which formats to use? Can you state more specifically which quality control is performed at the GEO3BCN repository? Any checks or guidelines which header words are set or should be provided? Especially for su-files it would be good to know whether it is "old su" format or XDR format, and whether it is little or big endian. I suggest a subsection "Data format" or "Technical issues of the data" in the article which could have at least some general statement regarding these issues (or where I can find this information in the website of the GEO3BCN repository).

«In the new version of the manuscript, a new section has been added: "4 Technical aspects of the data". Here, we briefly discuss the general acquisition parameters of the datasets and the formats of the different files included on the database. References for both SEG-Y and SU formats have been added as suggested. Further information on the details of each dataset can be consulted in the "show full item record" link in the left bottom corner of each dataset and in the publications cited. In addition, part of the information included in section "2 Outline of SeisDARE" has been moved to the current section "4 Technical aspects of the data" for consistency. Additionally, SU files follow the XDR format and have been produced in Linux workstations operating the little endian convention. Using modern versions of SU, the files should be readable in different platforms (Little or big endian, 32 or 64bit). »

- Although I think that su-format is quite handy and widely accepted, it is actually not a standardized exchange format. . . Actually SEG-Y should be preferred...

«SU is an open source and well-established format seismic processing package and we have added references to it in the new section 4. Furthermore, in our database only two

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up to 21 datasets are exclusively on SU format. Nevertheless, we are working on the conversion of the files from SU to SEG-Y, but this will be completed in the long-term.»

- [more a general comment] I did some spot checks of this large collection of data sets (only spot checks because the data is many hundreds of Gbyte (or even Tbyte); some of the datasets are even embargoed and thus not available). Data conversion and displaying was quite easy e.g. for the IBSESEIS NI and ILIHA data. Nevertheless, it brings me back to the question which policy and guidelines are present for quality checking... Also in these cases a bit more information on the actual data would generally be helpful (maybe an issue for the future?).

«Assessing the quality of the dataset in a completely objective and numerical way is a difficult issue, and currently we are not aware of a simple procedure. The ESFRI EPOS EU e-infrastructure (<https://www.epos-eu.org/>) is currently trying to address this issue aiming to define numerical indicators to estimate the quality of geophysical data collections, but this is not yet solved. In the meantime, we prefer to leave out any subjective/qualitative assessment of the data quality to avoid biasing the readers. In any case, each dataset contains a list of publications where the users can observe and estimate the quality of the datasets by themselves.»

- I noticed that on some of the individual dataset pages the format of the data is set to "unknown" (for example in the "CIMDEF: a wide-angle deep seismic reflection profile in the Central Iberian Zone" dataset", where all su files are set to "unknown"). It's probably an automatic association/analysis, however, the authors should consider to add this information.

«We have completed the format field in the repository website, as well as the description field.»

- I could not find index cards for the still embargoed datasets "3D reflection seismic imaging of the Hontomín CO2 storage site" and "SIT4ME: Innovative seismic imaging techniques for mining exploration - Sotiel-Elvira (Spain) dataset". Is this by purpose?

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Couldn't this type of metadata be made publicly available before the end of the embargo? In the text (Line 121) one could get the impression that index cards exist for all datasets.

«We would prefer to make the index cards for the embargo datasets available by the time they are released. Nevertheless, it is true that one can get a wrong idea from the text line 121, so we have modified this part of the text to clarify this issue. The new text reads as: “Additionally, an index card summarizes the information for all projects except for those that are embargoed due to data policy.”»

- L 117: The paper says that there are currently 19 datasets in SeisDARE, however, when I check <https://digital.csic.es/handle/10261/101879> I see 26 datasets? Although I understand that SeisDARE is open for new datasets, I think that the paper introducing SeisDARE should be up-to-date and list all of the currently contained ones. Furthermore, I noticed that there are some datasets listed which are not all DSS datasets, such as "Regional centroid moment tensors for earthquakes in the 2013 CASTOR gas storage seismic crisis" and "Apatite fission track and zircon (U-Th)/He dataset in the eastern Basque-Cantabrian Zone - western Pyrenees". Please comment. And there are many more. . . Or is it a mistake? It does not really fit to the other datasets of SeisDARE. . . I assumed that the link <https://digital.csic.es/handle/10261/101879> is exclusively pointing to SeisDARE?

«In the manuscript, we specified that the GEO3BCN database is multidisciplinary and that SeisDARE is part of it, but as it may lead to some confusion, we have re-organized the database website. In the new interface, there is a collection of data that belongs to SeisDARE and another collection with more general type of datasets from GEO3BCN. We hope that with this change it would be easier to follow and understand both the manuscript and the database website. »

TECHNICAL CORRECTIONS: L91: insert hyphen in "continental scale"

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L61: insert hyphen in "seismic-related" L61: What is an "active" data repository? Do you mean voluminous or comprehensive or large data repository?

«We meant in terms of the volume of data, but we realize that this sentence might be misleading and we have removed it.»

L141: I do not understand ". . . being the latter the external foreland zone..." Please check.

«Within the Iberian Massif only the Cantabrian Zone and the South-Portuguese Zone are external parts of the Variscan orogen. We have clarified it in the text.»

L396: insert hyphen in "high-resolution"

«We have unified the text to "high-resolution".»

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