

Review

Title: A focal mechanism catalogue of earthquakes that occurred in the southeastern Alps and surrounding areas from 1928 – 2019

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General remarks and comments:

The article is appropriate and the dataset is meaningful and useful. The dataset can be used in the current format and dimensions. Check only a few FMs to avoid inconsistencies. Figures and tables are correct and of good quality.

I really appreciate this kind of works that are fundamental tools for many analyses, as mentioned by the Authors. Data catalogs are not often seen as a novelty by the scientific community but hide a big effort for the rigorous data preparation and deserve much more visibility and resources.

I have only minor revisions to suggest and a check of parameters of few FMs.

More comments are in the following review.

Abstract

Line 18: delete: “However, ...“

Introduction:

I suggest to underline the great effort to prepare catalogues like the proposed one: collect, select parameters, standardize the FMs information and also elaborate new FPS solutions. This can be a useful reminder for FMs databases users. I also suggest highlighting and citing others datasets of FMs that assess a preferred solution too (e.g. Custodio et al., 2016; Kapetanidis and Kassaras, 2019 and not only Vannucci and Gasperini, 2004).

Line 53-54: “*At present, almost all seismological observatories compute quick moment tensors for earthquakes above approximately Mw 4.0.*” specify the thresholds of magnitudes for catalogues (e.g. Mw 5.0-5.5 for GCMT and so on). Also at line 24, the USGS has a higher threshold of Magnitude. Maybe you should cite the TDMT Catalogue of INGV.

Line 56: “*...local moment tensor catalogues.*”: add acronyms and information of the catalogues (RCMT, Regional Centroid Moment Tensor Catalog. Scognamiglio et al., 2009 provide the TDMT, Time Domain Moment Tensor catalogue. Moreover change the reference Scognamiglio et al., 2009 with Scognamiglio et al., 2006 (<http://terremoti.ingv.it/tdmt>))

Lines 58-59: “*database of the Stress World Map project (Zoback, 1992; Heidbach et al., 2018), contain both polarities and moment tensor FPSs of global seismicity.*”. This is correct as a general introduction, but in the database no one focal mechanisms is taken from these authors.

Line 78: “*Pondrelli et al. (2011)*” maybe 2001?

Lines 174-175: “*includes our knowledge of the main tectonic features of the area*”: I think the sentence is a bit vague, too subjective and not very transparent. Moreover, the Authors could calculate a weight in the database (e.g. criterion 1=100000, criterion 2=10000, criterion 3=1000 and so on). This explains in detail the choice of the preferred solution. Alternatively you can classify the preferred solution: P1, P2, P3, P4, P5.

Lines 177-180: Add a brief description on the “subjects” of the rotation, i.e. the preferred solution and the alternative ones (i.e. solutions of other authors) for the same earthquake. Caption of Fig 7: “...and the multiple focal mechanism solutions”: multiple is not appropriate, change to “alternative”

Lines 194-195: “...70 of which have been corrected with respect to the original information...”. Add a comment in the database about the changes.

Line 201: “CMT” is GCMT ?

Lines: 216-218: avoiding the second reference of Bressan et al, 2018 in the same sentence. Add the reference Serpelloni et al., 20116 (Tectonophysics) which also investigates the tectonic regime of this area.

Line 224: “...other available FPSs”, change in:other FPSs available for the same earthquake.

Line 231: Locati et al., 2016 can be change to CPTI15v3. Note that the magnitude of CPTI15 is Mw 6.08

Concluding remarks

Lines 243-252: specify that the database collects 936 focal solutions.

References:

Review the references and the correspondence with the text (e.g. Serpelloni et al., 2005 <https://doi.org/10.1111/j.1365-246X.2005.02618.x> is double)

I suggest moving the reference to GMT software from the text to the Acknowledgements

Database: “Focal mechanisms of the southeastern Alps and surroundings” available at <https://doi.org/10.5281/zenodo.4284971>

Authors could verify the parameters and the correspondence among the parameters to avoid inconsistencies. For example some FMs of Sukan et al. (2020) have negative B axis plunge (instead of the range: 0-90). In a few cases the nodal planes and the axes are not in agreement each other and the differences of parameters (e.g. some parameters of the nodal plane B derived from the nodal plane A are > 4 degrees, as well as some P and T axes derived from nodal planes or viceversa) (see table below)

Source	day	month	year
Muller, 1977	06	05	1976
Eva & Pastore, 1993	13	09	1989
Poli et al., 2002	05	10	1991
Bressan et al., 2018	01	06	2009
Restivo et al., 2016	28	10	2010
ISC	02	02	2013
Romano et al., 2019	02	05	2013
Romano et al., 2019	12	05	2015
Bressan et al., 2018	23	11	2017

I suggest to eliminate trend and plunge of B axis from the catalogue and to investigate about some solutions (table below) to improve the database:

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