

Solid Earth Discuss., referee comment RC2  
<https://doi.org/10.5194/se-2020-184-RC2>, 2021  
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## Comment on se-2020-184

Ruth Soto (Referee)

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Referee comment on "Application of anisotropy of magnetic susceptibility (AMS) fabrics to determine the kinematics of active tectonics: examples from the Betic Cordillera, Spain, and the Northern Apennines, Italy" by David J. Anastasio et al., Solid Earth Discuss., <https://doi.org/10.5194/se-2020-184-RC2>, 2021

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This work presents the application of AMS analysis to infer the kinematics of active orogens. It deals with two examples; the Betics (SE Spain) and the Apennines (Italy). I recommend its publication, but I have found some minor problems before it can be considered for publication.

Ruth Soto

### 1. General comments:

1.1. The work presents two examples from two orogens showing different tectonic contexts, samples analysed in different laboratories and also shows different magnetic mineralogy analyses. This matter makes difficult the direct comparison of data. Moreover, at its present format showing first the Method, Results and Discussion of Example I (Betics) and then that for Example II (Apennines), the manuscript could look like as two attached works. I think this could be solved focusing the work from a different point of view or selecting only one example and go in depth.

1.2. With respect to AMS data from the Betics, you mention that the orientation of K1 axes (i.e. magnetic lineation) is consistent with (1) the minerals lineations of Martínez-Martínez et al. (2002), which are linked to Middle Miocene-Pliocene low-angle extensional faulting, (2) the GPS geodetic data which shows the direction of convergence of the Betics to stable Africa and (3) Neogene brittle extensional structures and recent seismicity, and all are consistent with the same strain field. These three phenomena correspond to three different tectonic processes. Do you think the magnetic lineation result from the three processes? Or you think it is due only to one process and its orientation coincides with the others? Add a discussion related with the origin of the magnetic lineation found in your

study area (e.g. Cifelli et al., 2005).

## 2. Specific comments:

2.1. In the stereoplots of AMS data, please indicate n (number of specimens).

2.2. Figure 7. I have seen some k1 axes that I have not found on Fig. 3. Please check it.

2.3. Conclusions-Lines 297-298. "The AMS technique provides an effective way to identify both modern and paleo-kinematics from sediments and sedimentary rocks largely independent of the magnetic mineralogy of a specimen"

Specify that this occurs in the two studied examples, it is not a general rule.

## 3. Technical corrections:

3.1. Line 559-561. This reference is not correct, it lacks Balanyá, J.C. and through the text it should be cited as Martínez-Martínez et al., 2002. Correct it.

3.2. Fig. 3. Indicate what are the numbers 1 to 9 in the legend or figure caption.

3.3. Figure 13 and its figure caption. 13 is not "Drainage divide", isn't it? Check it.