

## ***Interactive comment on “Moment magnitude estimates for Central Anatolian earthquakes using coda waves” by Tuna Eken***

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The manuscript titled "Moment magnitude estimates for Central Anatolian earthquakes using coda waves" by Tuna Eken addresses the earthquake source characteristics revealed by decomposing the path and source effects in seismic data. Unfortunately, the manuscript is not well prepared: Description of the method is insufficient; some of figures are not correctly cited or never cited; a long review of geology is, however, not related to the discussion; and the discussion lacks some of important studies. It is hard to judge the value of this study from the present form of the manuscript. Detailed comments are listed below:

Specific Comments: 1. Section 2 (Reginal Setting and Data) has a long description

on the geological setting for four paragraphs, however, these are not related to any of discussions. It is nice to review the geological setting, but this can be significantly shortened for improving the readability.

2. Section 3 (Method) lacks an explanation on the  $g$  parameter. If possible, describe the formula of  $G$  as a function of  $g$  explicitly, so that it becomes understandable why the Author later used the grid-search scheme for optimizing the  $g$  parameter.

3. Figure 4 is cited in L239, however, Figure 4 and the text in L239-244 are inconsistent. Presumably Figure 5 should be cited here. Then Figure 4 is not cited anywhere. Figure 4 looks related to the estimation of the  $b$  parameter. Please clarify this.

4. The paragraph in L258-279 describes the demerit of the assumption of the frequency-independent attenuation factor and the omega-square source model, however, this paragraph should cite other studies already considering these problems. For example, Ide and Beroza (2001, doi: 10.1029/2001GL013106) pointed out the advantage of the empirical Green's function approach and corrected other studies' results one by one. As for the source spectra, Denolle and Shearer (2016, doi: 10.1002/2016JB013105) and Uchide and Imanishi (2016, doi: 10.1785/0120150322) pointed out the deviation of observed source spectra from the conventional omega-square model. Update the discussion by citing these papers.

5. The comparison between the coda-derived moment magnitudes and the local magnitudes was done simply done by the linear regression (equation (9)), however, it has been pointed out that moment magnitudes and local magnitudes are systematically different. Some of papers on this are Bakun and Lindh (1977, BSSA), Edwards et al (2009, doi: 10.1785/0120080292), Goertz-Allmann et al. (2011, doi:10.1785/0120100291), Munafo et al. (2016, doi: 10.1785/0120160130), Malagnini and Munafo (2018, doi: 10.1785/0120170303), and Uchide and Imanishi (2018, doi: 10.1002/2017JB014697). They proposed various types of regression curves, for example, composed of two straight line or a polynomial. Update the discussion by citing

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these papers and correct the abstract (L17-19) accordingly.

6. Figure 7 is not cited anywhere. Add text related to Figure 7, or delete this figure.

Technical Comments: L253: earthkquakes -> earthquakes

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Interactive comment on Solid Earth Discuss., <https://doi.org/10.5194/se-2019-8>, 2019.

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