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Comment on angeo-2021-11

Anonymous Referee #2

Referee comment on "The geomagnetic data of the Clementinum observatory in Prague since 1839" by Pavel Hejda et al., Ann. Geophys. Discuss.,
<https://doi.org/10.5194/angeo-2021-11-RC2>, 2021

Review of the manuscript "The geomagnetic data of the Clementinum observatory in Prague since 1839" by Pavel Hejda et al.

This manuscript presents a detailed analysis of historical geomagnetic measurements performed and recorded at the Cemetinum in Prague. The data set presents an unique and very valuable time series of such measurements starting in 1839. With great care the authors analyzed this data in order to reconstruct temporal variations of geomagnetic components in current physical units. Particularly the identification of possible error sources was treated with great care. Although the manuscript is very well written, there are some parts which definitely could be improved by proofreading of a native speaker. Nevertheless, I highly welcome this contribution and suggest acceptance of this manuscript after the following minor aspects have been considered.

General remarks:

- 1) The significance of historical records for the analysis of recurrence rates of geomagnetic storms/disturbances could be discussed more prominently. In the past years estimations on recurrence rates, amplitudes and consequences of geomagnetic storms are gaining more and more interest. Such historical data sets, as analyzed in this study, are an important source for such statistical and periodicity analyses. Thus they are highly valuable when it comes to estimating the possible severity of upcoming space weather events. Such recurrence rates are discussed for example in the following articles:
Riley P., On the probability of occurrence of extreme space weather events. Space Weather, 2012
Love J.J., Credible occurrence probabilities for extreme geophysical events: Earthquakes, volcanic eruptions, magnetic storms. Geophysical Research Letters, 2012
- 2) The discussion and description of the old instrumentation would further profit from

some statements regarding the dynamic range of these instruments. As the authors have a profound knowledge on the physical limitations of the historical measurement systems, such discussion would definitely provide an added value at least to section 5. Insights on how strong geomagnetic variations have been during these events and whether the records can represent true amplitudes would be a nice addition.

3) I wonder how a IGRF model can be obtained for the 19th century, as such models are only available since the 20th century. To my understanding, this is not possible. Please clarify what model you actually used. You are also comparing your data set to data from Munich. I did not find any citation, however. Please add a reference. (When posting my review I have seen that RC1 suggested that as well and provided a some important references)

Specific remarks:

5: by the then observers -> by the observers

47: in 1936 -> in 1836

52f: Joseph Stepling, started soon also -> "Joseph Stepling, also started" or "started ... as well".

78: of lost by fire -> of loss by

100: citation for Wolf and Wolfer

106: In Valach et al. (2019) ...

120: Emperor Garden -> Imperial Garden

198: have already been mentioned

211: by the then value -> by the value

225: clarified -> described

227: used for to perform the -> used for performing observations

228: recenetly been reminded ... (1979) -> Well, I would just say: has been discussed by...

230: was -> is

232: and hanged close to -> better just say: and close to

362: by moving manually -> by manually moving

384: This benefit is related to records ...

417: to that in Nevanlinna (1997).

427: in Valach et al. (2019)