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Annales Geophysicae Discussions

# *Interactive comment on* "Predicting the maximum *aa/Ap* index through its relationship with the preceding minimum" *by* Zhanle Du

**Anonymous Referee #1**

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The author uses smoothed monthly aa/Ap index to study the relation between the minimum and maximum aa/Ap values in order to predict the maximum value of the aa/Ap index.

Usually long-term smoothing is used to study the solar cycle; to show the correlation between the solar cycle and the index variations.

Due to the small number of high amplitude values, smoothing removes all the high amplitude maxima and move the data towards the minimum.

The author states that "the maximum aa index for the ensuing cycle 25 is predicted to be aamax(25) = 26.9$\pm$2.6." This is very small value and it could be mistakenly understood that this solar cycle will be very quiet.



The values listed in Table 1 under the aamax are much smaller than those observed in any disturbed day. These values can't represent the maximum aa index or the strength of the geomagnetic activities. As it could be seen from Fig. 1 the aa index has arrive to a peak value of about 67 nT in 19 March 2020 and the Kp value for this time is 4+

Also the paper is based on the data listed in Table 1. Which have been retrieved from smoothed aa index data. The smoothing could be done in many different ways each will produce different data sets.

However, when considering the geomagnetic activities, we are usually interested to know how sever it will be and for how long it will last.

Therefore, I suggest the following It should be stated clearly that these max values are for smoothed aa index and it should be given a special note. The paper title should also indicate this.

The author could try to compare the expect strength of the 25 cycle with the previous cycles. So, we could understand is it will be more active or less active.

The author could try to predict a more reliable maximum of the aa index for the 25th cycle. To do so I could suggest to construct two data sets of the observed aa index minimum and maximum values for each 3 days or more. These two sets could be smoothed for 13 months. The correlation between these two data sets (for 3 days min and max values) are about 0.79 From these two data sets the author could peak the maximum and minimum aa index for each solar cycle and replace these values with those in Table 1.

Finally, the units of the indices (nT) should be written in text and on the Figures.

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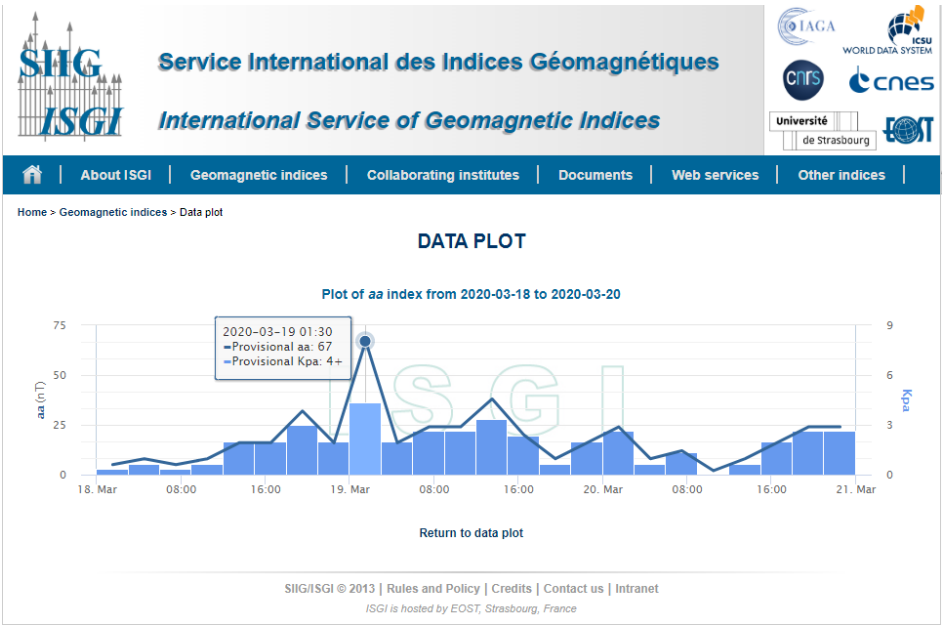


**Fig. 1.** aa index for the period 18-20 March 2020



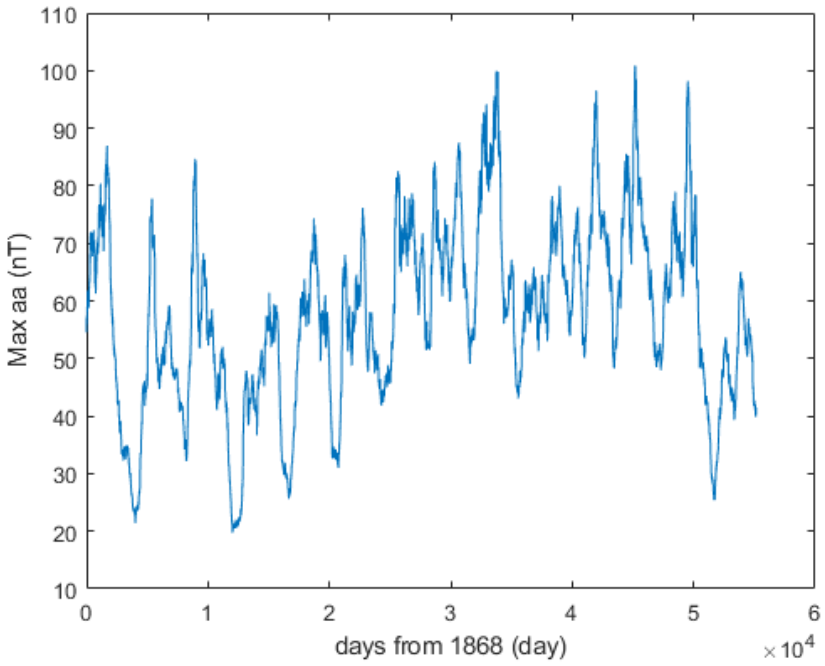


**Fig. 2.** Smoothed Max aa index

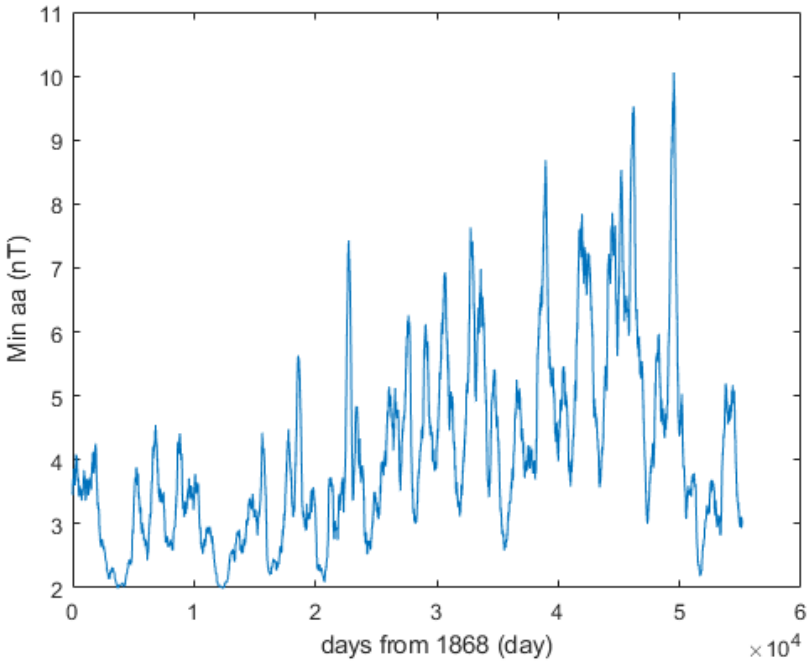


**Fig. 3.** Smoothed Min aa index