

## ***Interactive comment on “On the validation of K index values at Italian geomagnetic observatories” by Mauro Regi et al.***

**Anonymous Referee #1**

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### GENERAL COMMENTS

The paper addresses the problem of determining the K<sub>9</sub>-limit, which is the main input parameter for calculation of geomagnetic K indices. This problem is particularly important for newly established geomagnetic observatories in mid-latitudes, since K indices apply to such observatories. This is the case of Duronia and Lampedusa observatories the authors are connected with.

The broadly understood quality of K indices determined by a given observatory depends (among other things) on a correct determination of the K<sub>9</sub>-limit. The paper stresses correctly that this is a fundamental issue connected with K indices. Determining the appropriate K<sub>9</sub>-limit at the beginning will result in correct K indices in the future.

C1

The method proposed by the authors involves a statistical comparison of K indices of the new observatory with K indices from reference observatories. As reference observatories Niemeck and Wingst were selected. These observatories were selected since they belong to the observatories that contribute to the official K<sub>p</sub> network, and their local magnetic time is close to Duronia and Lampedusa. The K<sub>9</sub>-limit for the new observatory was changed in a way ensuring maximal statistical correlation with reference observatories.

The experience on determining the K<sub>9</sub>-limit gained by the authors can be re-used by other observatories in the world. However, a problem may be to find good reference observatories, which fulfill at the same time two conditions. This is belonging to the K<sub>p</sub>-network and their local magnetic time is close to the given observatory.

Another interesting undertaking of this work was to compare two computer methods of determining K indices, the ASM and FMI method. These are the methods most frequently used by geomagnetic observatories. The statistical studies show that both methods give similar results for slightly different K<sub>9</sub>-limits.

In general it can be summarized that the article is worth publishing. I believe that this paper can be interesting for many scientists in the world engaged in the work of geomagnetic observatories.

### SPECIFIC COMMENTS

1)

In this paper is no information whether there was an attempt to obtain K<sub>9</sub>-limits for Duronia and Lampedusa from ISGI (International Service of Geomagnetic Indices). According to information on [http://isgi.unistra.fr/isgi\\_refservice.php](http://isgi.unistra.fr/isgi_refservice.php) ISGI “ has the responsibility of IAGA geomagnetic indices derivation and dissemination, and to ensure the homogeneity of the data series”

2)

C2

In the paper “K9” or “K9 value” should be rather replaced with “K9-limit”. The name “K9-limit” is closer to the idea of this parameter.

#### TECHNICAL CORRECTIONS

Line 45: on <https://www.gfz-potsdam.de/en/kp-index/> we can see Lat=52deg4min (not 47.94deg)

Line 55: should be Finnish Meteorological Institute (not Meteorological)

Line 55: should be LRNS provided by Hermanus Magnetic Observatory, CISR, South Africa

Line 280: consider deleting “the” or write “that they”

Line 289: should be 12b(89)

Line 303: Should be rather Geophysical Journal International

Line 312: Should be 10.1029/2018GL078387

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<https://doi.org/10.5194/gi-2019-31>, 2019.