

Caution for the final Dst index regarding missing data

WDC Geomagnetism, Kyoto

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The definitive geomagnetic data provided by INTERMAGNET are used to calculate the recent final Dst index. The definitive geomagnetic data are occasionally missing, and there are long periods of missing data in the following listing periods:

| station | year | period |
|---------|------|--------------------------------------|
| SJG | 2017 | Mar. 17 to Dec. 31 |
| SJG | 2018 | Jan. 1 to Jun. 6 |
| SJG | 2020 | Aug. 1 to Aug. 20, Sep. 9 to Sep. 23 |

In the periods with missing data, the number of stations used to calculate of the Dst index was less than or equal to 3. Also, the data missing for more than one month affect the annual modeling of the Sq variation by double Fourier series (see <https://wdc.kugi.kyoto-u.ac.jp/dstdir/dst2/onDstindex.html> for details). To obtain the coefficients of the double Fourier series for the data for the year with large amounts of missing data, we filled the averaged data for quiet days for the month with missing data with zero. This means that the data for missing months do not contribute at all to the Fourier series coefficients. We have verified that the computed Sq-variation generated by the double Fourier series is a good representation of the observed Sq-variation. Therefore, we believe that this processing for the missing data is unlikely to make a significant difference in the calculated index that would change your scientific conclusions, but if you are concerned, please check the original geomagnetic data from each station.