

EFFECTS OF STATION RELOCATION IN THE AA INDEX

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Earlier studies have shown that the long-term measure of geomagnetic activity, the *aa* index, is inhomogeneous and depicts an excessively large (about 12 nT) centennial increase. This has preliminarily been suggested to be due to possible station intercalibration problems in 1957 when the northern *aa* station was changed from Abinger to Hartland. In the present paper we show that the 3-hourly *aa* index time series is not uniform but includes systematic jump-like changes in the distribution of the various *aa* values with each change of stations in 1920, 1926, 1957, and 1980. We estimate how large a change to the *aa* index was caused by each particular *aa* value. We find that the changes to the *aa* index due to different ranges of activity are smooth and fairly similar for all jumps. In 1957 the largest *aa* values had, at the expense of more moderate *aa* values, a relatively larger contribution to the jump than in other station changes because the relative station coefficient was somewhat larger in 1957, leading to larger spreading and a higher average level of *aa* values. However, while this difference could cause a slight overestimate of the *aa* values, we find that the total changes in the *aa* index over jumps are in agreement, in both sign and magnitude, with the solar cycle variation. So it is unlikely that the excessive increase of the *aa* index would be due to erroneously estimated station coefficients.

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