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Worldwide observatory hourly mean values 1995 to 2003: an investigation of their quality

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High resolution observatory data are important not only to complement the modern geomagnetic satellite data, but also as long time series, e.g. for secular variation and induction studies, or to improve the external field description in geomagnetic field models. Hourly mean values are common data products from geomagnetic observatories and a large number of these data is available at World Data Center C1, Copenhagen. Unlike satellite data, observatory data are processed locally by many different institutions. An important step of the processing is the calibration of the continuous variation recordings by discrete absolute measurements, i.e. the determination of the component baselines. Without proper calibration, data may exhibit artificial variations and "jumps", sudden shifts of level. It can happen that not properly calibrated data or erroneous values find their way into the WDC database. We examined data from worldwide observatories between 1995 and 2003 by intercomparison of observatories and comparisons to a global model. A number of outliers were found, as well as calibration problems. In most cases a correction is not straightforward and it will be necessary to consult the original data at the individual observatories to fix the problems. Here, we discuss our methods of checking the geomagnetic data and provide a table of identified problems to alert both the data owners and users about problems.