



A new approach to directly determine the secular variation from magnetic satellite observations

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Observatory monthly means provide an excellent opportunity to study the magnetic field changes with time at a given location. However, determination of the global pattern of field changes using observatory data is hampered by the very uneven distribution of the present observatory network. Satellite data, on the other hand, provide an excellent global coverage, but the satellite movement makes a direct comparison of satellite and observatory data difficult.

To investigate short-period secular variation in observatory and satellite data, we have derived an approach to extract satellite monthly means at a regular network of "virtual observatories" at 400 km altitude, based on CHAMP magnetic observations.

Comparison of these satellite monthly means with the corresponding ground-observatory values shows a remarkable well correlated signal at time-scales of months to years, which is beyond the temporal resolution limit of recent global field models like CHAOS (www.spacecenter.dk/projects/oessted/models/). One part of the signal is linked to the short-period secular variation, while another part is more likely magnetospheric in origin.

In this presentation we describe our approach, its validation, and discuss how the results can be used to model the short-period changes of the recent geomagnetic field.