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Interactive comment on “Observatory crustal magnetic biases during CHAMP satellite mission”

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The aim of our paper is to study the crustal biases temporal evolution over nine years of CHAMP satellite mission (from 2000 to 2009) at different locations. More precisely, we investigate the biases over longer time span (9 years), rather than calculating biases just for particular epochs, as it has been done in most of previous studies. Moreover, the chosen temporal resolution (monthly means) provide us the possibility to better recognize the external field contributions in bias time series.

To recall, in our previous crustal biase investigation, we examined the European observatory biases over the 42 years (1960–2002), but using observatory annual means. The new temporal resolution and the high accuracy of the available geomagnetic models bring the novelty in investigating the crustal bias temporal evolution. The long

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term trends and short period variations in monthly bias time series are noticed, and therefore we examine both variations in order to estimate their relative contribution.

The average of the bias for each observatory over nine years (June 2000 to August 2009) provide us with an order of magnitude of the constant crustal field contributions at different locations.

Although the annual trend in most of biases series is noticed, these trends lie within the SD of the averaged biases. Further, the comparison of averaged biases obtained using only November and December monthly means of each year with the similar biases based on 2 months of Oersted and MAGSAT data as provided by Mandea and Langlais (2002), shows that they are in good agreement for most observatories.

All these indicate that the crustal field probably does not change over the last 30 years. Then, the remain short period variations are related to external fields. To study in detail the later contribution (possibly separately for each year) and reveal the external field patterns that may be removed from the observatory data, the good coverage with geomagnetic observatories over geomagnetic latitudes is needed. This is a topic under study.

We thank the referee comments, and in the new version we will consider his/her comments, as following:

- we will clearly indicate the aim of our study
- we will specify that the 1999.92 is the epoch related to two months (November and December 1999) of Oersted satellite data
- we will better indicate that the monthly means include external field; the presence of several signals with varying periods in each component suggests that the involved process is far from simple; additionally, there may be superposition of many signals to create the complicated spatial and temporal behavior; this is work in progress.

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