

Template for comments and secretariat observations

Date: 2006-06-23

Document: ISO/CD 22009

| 1 | 2 | (3) | 4 | 5 | (6) | (7) |
|-----------------|--|---|---|--|--|---|
| MB ¹ | Clause No./ Subclause No./ Annex (e.g. 3.1) | Paragraph/ Figure/Table/ Note (e.g. Table 1) | Type of com- ment ² | Comment (justification for change) by the MB | Proposed change by the MB | Secretariat observations on each comment submitted |
| JP | Expl. rep. | | te | Explanatory report needs some additional figures | Add the Figures | CLOSED: accepted |
| US | | | ge | Standard development must be completed in coordination with International Association of Geomagnetism and Aeronomy (IAGA) | Establish the contacts with IAGA | CLOSED: accepted |
| JP | Expl. Rep. | Figure 1 | te | In figure 1, a relative difference between the model field and observation is given as a histogram. The distribution is not a Gaussian one but an asymmetric distribution with a standard deviation of about 80%. It is difficult to judge whether this standard deviation (80%) is satisfactory or not because the region (location) of comparison is not shown. If a satellite is in the near Earth region, the model field should be close to the Earth's main field, a relative error of 80% being huge. On the other hand, if the location of comparison is in the tail, a 80% difference may not be so bad because the field in this region is always fluctuating, especially inside the plasma sheet. | A comparison should be made separately for different regions of the magnetosphere. | CLOSED: accepted In Figure 1 the "delta B" is compared with observations. The dipole magnetic field is eliminated from calculations, sigma being calculated only for the magnetospheric sources. So, no matter in what region the comparison takes place |
| JP | Expl. Rep. | Figure 5b | te | Figure 5(b) shows a comparison with the geomagnetic Dst index. According to this model, the effects from the ring current and the tail current are almost comparable. A relative contribution from each current system is currently under strong discussion (e.g., Turner et al., JGR, 2000; Greenspan and Hamilton, JGR, 2000; Dremukhina et al., JGR, 1999). | The advantage (or the problem) of their model may be clarified through discussion in near future. | CLOSED: accepted The advantage (or the problem) of the model is clarified through the recent discussion. |
| JP | Expl. Rep. | Figure 6 | te | A comparison with the GOES satellite shown in Figure 6 should be extended for other periods and a statistical evaluation should be made extensively. | To make a comparison with observation or with the model by Tsyganenko, which is widely used in our scientific community. | CLOSED: accepted Comparisons with the GOES-6 satellite are made for the period during magnetic storm under consideration. There exist other comparisons with the |

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NOTE Columns 1, 2, 4, 5 are compulsory.

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| | | | | | | GOES satellites in recent papers. The first comparisons with T96 model are included in the Working Draft |
| JP | Expl. Rep. | Figure 1 | ed | In the caption of Figure 1 and 2, the word "interplanetary field" is used probably to denote magnetic field inside the magnetosphere, however, we normally use the word to denote the solar wind magnetic field outside the magnetosphere. | To devote more effort in polishing up the English writing. | CLOSED: accepted |
| FR | Expl. Rep. | | ge | Though you do not refer to the Olson-Pfitzer model, which is, from my point of view, the best for the current external field, your model seems not too far from this one, but with many improvements | Refer to the Olson-Pfitzer model | CLOSED: accepted In some sense this model is similar to the developed one, because it includes several types of the current system each with different time behavior, probably. It is necessary for modeling of the disturbed magnetosphere. |
| FR | Expl. Rep. | | ge | To become a standard, the model needs many comparisons with measurements, especially with measurements onboard satellite located in different regions (let say from LEO to GEO orbits). | To become a standard, your model needs satellite comparisons | CLOSED: accepted The model is compared with magnetopause cross-section data base (David Sibeck) and LMDB magnetic field data base (Hedchcook- HEOS 1,2 and Fairfield - IMP, ISEE). |
| FR | Expl. Rep. | | te | Questions: -Is $\text{div } B = 0$? (and is it possible to find a vector potential?) -I am really convinced if the partial ring current is of | | CLOSED: questions are answered 1. Yes, $\text{div } B = 0$ in our |

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| | | | | <p>great importance for the external field under your consideration? Are you planning to add it? How do you compare it with Dst, which is an average over the longitude of the stations ?</p> <p>Do you average your field to compare with?</p> <p>-you say an accuracy is 20nT and the Figure shows 60nT for Nov 25 around 3:00 UT?</p> | | <p>model and is it possible to find a vector potential. But we used the scalar potential (outside the regions occupied by the currents). Our scalar potentials are a solution of the Laplace equation.</p> <p>2. Yes, the partial ring current is important for inner magnetosphere. We are planning to include this source in the magnetospheric model. Our model gives a good chance to add a new current system, because for each current system separately we have $B_n=0$ on the magnetopause . (But I think that the partial ring current is large only during main phase of the magnetic storm.)</p> <p>3. Yes, we are planning to include additional sources during preparing of the final version of the standard. Moreover we think that maybe the best results will be obtained using any superposition of several models.</p> <p>4. We calculated the model field at the Earth's center. This value is equal to</p> |

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| | | | | | | longitudinal average strength of the magnetic field at the equator. 5. Yes, we average discrepancy between model's strength of the magnetic field and measured value. 60 nT at 03:00 25.11.86 is maximum value of the difference and 20 nT is rms. |
| JP | Expl. Rep. | | te | As long as I know, the word "interterrestrial current" is not used to describe the current which flows inside the Earth. | Change notification | CLOSED: accepted The words "interterrestrial currents" was changed for Induced currents. |
| JP | Expl. Rep. | | te | The derivation (or references which describe it) of eqs.(4) and (7) should be shown. | Give derivation | CLOSED: accepted Eq.4 derivation and reference describing eq.7 were introduced in text. |
| JP | Expl. Rep. | | te | There is no description on the parameter g_r (page 9) how it is obtained. | Give description | CLOSED: accepted The g_R parameter description was included in the text. |
| JP | Expl. Rep. | | te | On eq.(7), in the previous model by the author, the tail lobe magnetic flux was obtained from the latitude of equatorward boundary of the auroral oval. In this version, the AL index is used instead of the latitude. However, I guess, the statistical result which leads to eq.(7) contains large error. | An error estimation (or description on the error) should be shown. | CLOSED: accepted The geotail magnetic flux can be calculated via the polar cap boundaries. Other method which is being used now, is based on statistical dependence of the magnetic flux on AL index. A comparison of magnetic fluxes calculated by these |

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| | | | | | | two methods shows a general agreement in the absolute magnitude and in variations during the magnetic storm. To estimate an error in the polar cap, the magnetic flux assuming that the polar cap during the magnetic storm main phase is circular with radius of 18 degrees in colatitude and a given error in boundary location of about 3 is of interest. An error in the flux would be about 35%. |
| IAGA | 3.2 | | | The draft standard is too closely tied to a single model of the magnetosphere | to use a process-based approach | CLOSED: accepted The paraboloid model of the magnetosphere is now the working example. |
| IAGA | 5. | | | The IAGA proposal for a Standard Model of the Earth's Magnetosphere included also list of criteria, which could be provided as the basis for CD22009. | Standard should be formulated as a set of specifications “For example, to show compliance, a candidate model might be required to include a clear specification of the input data used to derive the model and where these data were measured” “a statement of the modeling approach used, i.e., is the model empirical (i.e. simply a fit to data), physics based, or a ‘general circulation’ (MHD) type of the model “ | CLOSED: accepted A new version of the CD-22009 standard is prepared on the basis of a new approach proposed |

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| | | | | | “a statement on the model’s domain applicability” “evidence of mean and rms errors in fitting data not in the model” | |
| IAGA | 2.1 | | | The IGRF has no formal status as a standard in the sense of ISO recognition and IAGA cannot agree on this without public investigation and discussion | | CLOSED: accepted The IGRF model is not a subject of standardization now |
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