The Earth's magnetosphere modeling and ISO standard

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The empirical model developed by Tsyganenko (T96) is constructed by minimizing the rms deviation from the large magnetospheric data base (Fairfield et al., 1994), which contains Earth's magnetospheric magnetic field measurements accumulated during many years. The applicability of the T96 model is limited mainly by quiet conditions in the solar wind along the Earth orbit. But contrary to the internal planet's field, the external magnetospheric magnetic field sources are much more time-dependent. A reliable representation of the magnetic field is crucial in the framework of radiation belt modelling, especially for disturbed conditions. The last version of the Tsyganenko model has been constructed for a geomagnetic storm time interval. This version based on the more accurate and physically consistent approach, in which each source of the magnetic field would have its own relaxation timescale and a driving function, based on an individual best fit combination of the solar wind and IMF parameters. The same method has been used previously for paraboloid model construction. This method is based on *a priori* information about the global magnetospheric current systems structure. Each current system is included as a separate block (module) in the magnetospheric model. As it was shown by the spacecraft magnetometer data, there are three current systems, which are the main contributors to the external magnetospheric magnetic field: magnetopause currents, ring current, and tail current sheet. Paraboloid model is based on an analytical solution of the Laplace equation for each of these large-scale current systems in the magnetosphere with a fixed shape (paraboloid of revolution). The input parameters of the paraboloid model characterize these magnetospheric current systems (their intensities and locations). These input parameters are determined from empirical data. Such approach allows us to use the model for any external conditions, so it can be applied for the Earth's magnetosphere and for radiation belt modeling. The status of the paraboloid model as an ISO standard and the relationship between scientific magnetospheric models and ISO standard which can be used for technical needs are discussed.