Visualization of geomagnetic field models on Google Earth - Towards simultaneous interpretation with other geoscience data -

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Google Earth is a widely accepted tool in our geoscience community, which enables us to visualize various kinds of geoscience data simultaneously on a virtual 3-D globe. This simultaneous visualization has a potential to bring a new discovery in the structure and/or activities of the Earth's interior. A conversion process from the data to the KML format is needed in order to browse target data on Google Earth, so that a useful tool to do this conversion is expected to be available for everyone. We adopt Google Earth as a common browser for data related to the solid earth science, and have been promoting a project to develop KML generators that enable us to obtain KML files easily and quickly applying to various kinds of geoscience data (Yamagishi et al.[2006]). Some KML generators applicable to seismic tomography data and geochemical data of rocks are already available via the website of our data center called "Pacific 21".

As a part of this project, we have been developing a KML generator that outputs a KML file from a geomagnetic field model given as a set of spherical harmonic coefficients (i.e., Gauss coefficients). Some parameters used in the conversion can be controlled through a user interface such as a range of the degrees of coefficients, a grid interval, an area of interest, and a scale of the color bar. Two types of the KML generators are developed; one is a Java-based software executable on a stand-alone PC, and another one is a web application software available via the website of Pacific 21. The latter one implements a scheme of high-speed computation, so that it can provide a KML file without keeping users waiting for a long time even in the case of a geomagnetic field model having a number of spherical harmonic degrees (i.e., spatially high-resolution model).

We show some examples of KML files obtained from the main field model (i.e., IGRF/DGRF) and the magnetic anomaly field model (i.e., NGDC-720), and compare these KML files with those obtained from other geoscience data. It is for the first time in the community of the geomagnetism that such KML generators applicable to geomagnetic field models are open to public. We believe that these KML generators will play an important role in the cross-disciplinary researches of the Earth's interior.