

## Statistical characters of non-regional changes in geomagnetic survey records

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Magnetic records can be separated into two parts: common changes and their residuals. Common changes are due to the Earth's external field and internal core field. Residuals contain tectonomagnetic signals as well as observation errors. Each component of residual has different statistical characters in their temporal dependencies. Residuals due to tectonomagnetic signals should be larger when the observation interval becomes longer. On the other hand, those due to observation error are independent to observation intervals. Which of these effects is dominant should be considered because they determine required precisions of observations aiming at detection of tectonomagnetic signals. To solve the problem, a statistical model which includes time dependency of errors is fitted to the first order geomagnetic survey results by the Geographical Survey Institute (GSI) and annual values at magnetic observatories of the Japan Meteorological Agency and GSI. The maximum likelihood estimation of the model shows that time-dependent components actually exist in the residual field. However, they are not proportional to observation intervals but proportional to square roots of them. This implies that tectonomagnetic signals in the geomagnetic survey results mainly contain irregular variations rather than constant increases or decreases.