歴史記録にみられる考古地磁気変化と地球自転速度変化の関連

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Relation between archaeomagnetic variations and the Earth’s rotation in historical record

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The earth’s magnetic field has close connection to the Earth’s rotation, which is apparent from the observation that the shape of the Earth’s magnetic field is approximated by a magnet located at the center of the Earth parallel to the rotation axis through geologic time.

Both the Earth’s magnetic field and rotation rate has been observed directly by instruments for the last four centuries, and, in the prior period, by indirect method, individually. In the prior period, the archaeomagnetic study revealed the change in the direction and intensity of the magnetic field. The historical records of eclipses supply information of the change in the rotation rate.

An interesting observation of these data sets is the variation in the 17th century. The movement of north geomagnetic pole changed from counterclockwise rotation to clockwise rotation, possibly associated with acceleration of decrease in dipole intensity. The last four centuries after then is characterized by the westward drift of non-dipole component. In the record of rotation rate, on the other hand, a large amplitude fluctuation is reported in the 17th century. Further archaeomagnetic data prior to and during this event, detailed in time and space, will give a key in understanding the relation between magnetic field and rotation of the Earth.

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