S002-P06
ポスター 1 ：11/24　PM1/PM2 （13:15-18:15）

2024 年 5 月磁気嵐に伴った西向き地磁気変化

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Westward geomagnetic change accompanying a magnetic storm in May 2024

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Accompanying the magnetic storm in May 2024, appearance and disappearance of westward geomagnetic change in the end of the main phase or the beginning of the recovery phase were observed at geomagnetic observatories and stations in Japan including Yatsugatake Geoelectromagnetic Observatory (YAT), Earthquake Research Institute, the University of Tokyo. Its quantitative description is presented.

Provisional geomagnetic records from 18:00, May 10 to 18:00, May 11, 2024, in UT at 32 geomagnetic observatories and stations which are YAT, 11 observatories and stations of Geospatial Information Authority of Japan, and 20 INTERMAGNET observatories of which longitudes are close to that of Japanese island arc and geomagnetic latitudes are between -50 and 50 degrees are analyzed. Identifying in the geomagnetic records for 24 hours both the trend components by polynomial approximations, and the shorter-period components which correlate at observatories and stations by the empirical orthogonal function analysis, these components are removed from original geomagnetic records.

The residuals show that the westward geomagnetic change between approximately 03:00 and 09:00 on May 11 is found at the observatories and stations remarkably in the northern hemisphere. Its amplitude at YAT amounts to approximately 90nT. It took approximately 10 and 30 minutes for the appearance and disappearance, respectively, of the westward geomagnetic change, while for approximately 320 minutes the change was stably holded. The amplitude was larger at higher latitude in the northern hemisphere: 30nT par 10 geomagnetic latitudes, while almost unseen in the southern hemisphere. As for the vertical component, downward change which amounts approximately to 40nT at YAT is found. Geomagnetic latitude dependency is less dominant. Since at Hawaii the westward and downward geomagnetic change is not clearly seen, it is presumed that the geomagnetic change appears in the dayside region.

Clarification of the electric current system causing the westward geomagnetic change which is prominent in the dayside is expected.

2024 年 5 月の磁気嵐に伴い、東大地震研究所八ヶ岳地球電磁気観測所 (YAT) を初めとする国内の地磁気観測所・観測点において、主相の終盤ないし回復相の初期に西向き地磁気変化の発生と消滅が確認された。本発表はその特徴を定量的に抽出し、その結果を記述するものである。

東大 1 点、国土地理院 11 点、及び INTERMAGNET から日本列島と経度が近く磁気緯度が± 50 度以内の南北半球の 20 点を選び、合計 32 地点の地磁気データ暫定値の 3 成分について、世界時 5 月 10 日 18 時から 11 日 18 時までを解析した。24 時間のデータからトレンド成分を多項式近似で、また全点の 3 成分で相関のある短周期成分を経験的直交関数解析で同定し除去した。

その結果、11 日 3 時頃に始まり 9 時頃に終わる西向き地磁気変化が、北半球の地点において特に顕著に見出された。YAT における西向き地磁気の変化量は約 90nT であった。西向き地磁気の発生と消滅の所要時間はそれぞれ約 10 分及び約 30 分で、継続時間約 5 時間 20 分の間、概ね一定の値をとる特徴があった。振幅は、南半球では顕著には見られない一方、北半球では高緯度ほど大きく、磁気緯度 10 度につき 30nT 程度の増加量であった。地磁気鉛直成分では下向き変化を伴い、YAT では約 40nT、磁気緯度による顕著な変化はない。ハワイでは西向きかつ下向きの顕著な地磁気変化が見られないため、昼側の領域で見られた現象と推測される。

この昼側で顕著な西向き地磁気変化の要因となる電流系の解明が期待される。