

Monthly Magnetic Bulletin December 2023

**BOĞAZIÇI UNIVERSITY
KANDİLLİ OBSERVATORY and
EARTHQUAKE RESEARCH INSTITUTE
GEOMAGNETISM LABORATORY**



<https://jeomanyetizma.bogazici.edu.tr/>

*Magnetic Results from
İznik Magnetic Observatory*



BOĞAZIÇI ÜNİVERSİTESİ

KANDİLLİ RASATHANESİ VE DEPREM ARAŞTIRMA ENSTİTÜSÜ

JEOFİZİK ANABİLİM DALI, JEOMANYETİZMA LABORATUVARI

Yer manyetik alanının zamana göre değişimleri ve Türkiye için bölgesel değerleri Boğaziçi Üniversitesi, Kandilli Rasathanesi ve Deprem Araştırma Enstitüsü, Jeofizik Ana Bilim Dalı, Jeomanyetizma Laboratuvarı tarafından iki ayrı rasathanede yapılmaktadır. Bu rasathaneler;

- İstanbul-Kandilli Manyetik Rasathanesi (ISK) ,
- İznik Manyetik Rasathanesi (IZN) dir.

İstanbul-Kandilli Manyetik Rasathanesi; jeomanyetik ölçülerine sistematik olarak 1947 yılında başlamıştır. Jeomanyetik kayıtlar La Cour Variometresi ile 1947-2000 yılları arasında fotoğrafik kâğıt üzerine alınmıştır. ISK Manyetik Rasathanesi 50. yılında INTERMAGNET (Uluslararası Gerçek Zamanlı Manyetik Rasathaneler Ağı)'e bağlanmıştır. Dakikalık olarak kaydedilen manyetik veriler INTERMAGNET'e günlük veri paketleri halinde gönderilmektedir. Maalesef, jeomanyetik ölçüler doğal olmayan çevresel gürültülerden kolaylıkla etkilenebilmektedir. Bu sebeple; 2004 Haziran ayında İznik yakınlarında yeni bir manyetik rasathane kurulmuş ve 2007 yılında INTERMAGNET üyesi olmaya hak kazanmıştır. Çalışmalar Kandilli Rasathanesi İznik Deprem Zararlarının Azaltılması Merkezi ile ortak yürütülmektedir.

Yermanyetik alanının **H** (yatay bileşen), **D** (sapma açısı) ve **Z** (düşey bileşen) bileşenlerinde meydana gelen anlık değişimler flux-gate variometresi ile ölçülmektedir. **F** (toplam alan) mutlak ölçümleri overhouser ve proton manyetometresi, **D** ve **I** (eğim açısı) mutlak ölçümleri ise D/I teodolit sistemi ve bu sistem üzerine kurulu bulunan tek eksenli flux-gate manyetometresi ile yapılmaktadır. Mutlak ölçümler rasathanelerin baz eğrisi değerlerinin belirlenmesinde kullanılmaktadır ve yapılması son derece hassasiyet gerektirmektedir. Mutlak ölçüler haftada en az iki kez olmak üzere yapılmaktadır. Kayıtlarımızda uluslararası zaman dilimi kullanılmaktadır.

Bu bültende, Iznik Manyetik Rasathanesi'nde 01 – 31 Aralık 2023 tarihlerinde kaydedilen jeomanyetik alan değişimleri **X** (kuzey bileşen), **Y** (doğu bileşeni) ve **Z** bileşenleri için günlük grafik formatında verilmiştir (Şekil-1). İstenilen gün ve saate ait sayısal manyetik veri, Kandilli Rasathanesi ve Deprem Araştırma Enstitüsü Müdürlüğü'ne yapılan resmi müracaat ile elde edilebilmektedir.

BOĞAZIÇI UNIVERSITY

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GEOPHYSICS DEPARTMENT, GEOMAGNETISM LABORATORY

The temporal variations of the Earth's magnetic field and the regional variations within Turkey are recorded in Boğaziçi University, Kandilli Observatory and Earthquake Research Institute, Geophysics Department, Geomagnetism Laboratory. These measurements are recorded at two observatories. Those are;

- İstanbul-Kandilli Observatory (ISK),
- İznik Magnetic Observatory (IZN).

Istanbul-Kandilli Magnetic Observatory started its systematic geomagnetic measurements after 1947. Photographic paper magnetic data records between 1947–2000 are taken by using La Cour variometer. ISK Magnetic Observatory was a member of INTERMAGNET (International Real-Time Magnetic Observatory Network) in its 50th anniversary, 1997. The minute mean digital data of ISK were transferred to INTERMAGNET daily. Unfortunately, geomagnetic measurements are affected by the artificial noises. Therefore, we set up a new geomagnetic observatory near Iznik (formerly NICEA), and started observations in August 2004. IZN Magnetic Observatory has been the member of INTERMAGNET since 2007. Magnetic studies are co-operated with Kandilli Observatory Iznik Earthquake Hazard Mitigation Center.

The variations of three components; **H** (horizontal component), **D** (declination angle) and **Z** (vertical component) of the Earth's magnetic field are observed with fluxgate magnetometers. Absolute measurements of **F** (total component) component is measured with overhauser and proton precession magnetometer, **D** and **I** (inclination angle) angle measurements are taken by using D/I theodolite and its single-axis flux-gate magnetometer. Absolute measurements are taken to produce the base line values. Throughout a year, these measurements are carried out twice a week or more if necessary. Universal time is used in our records.

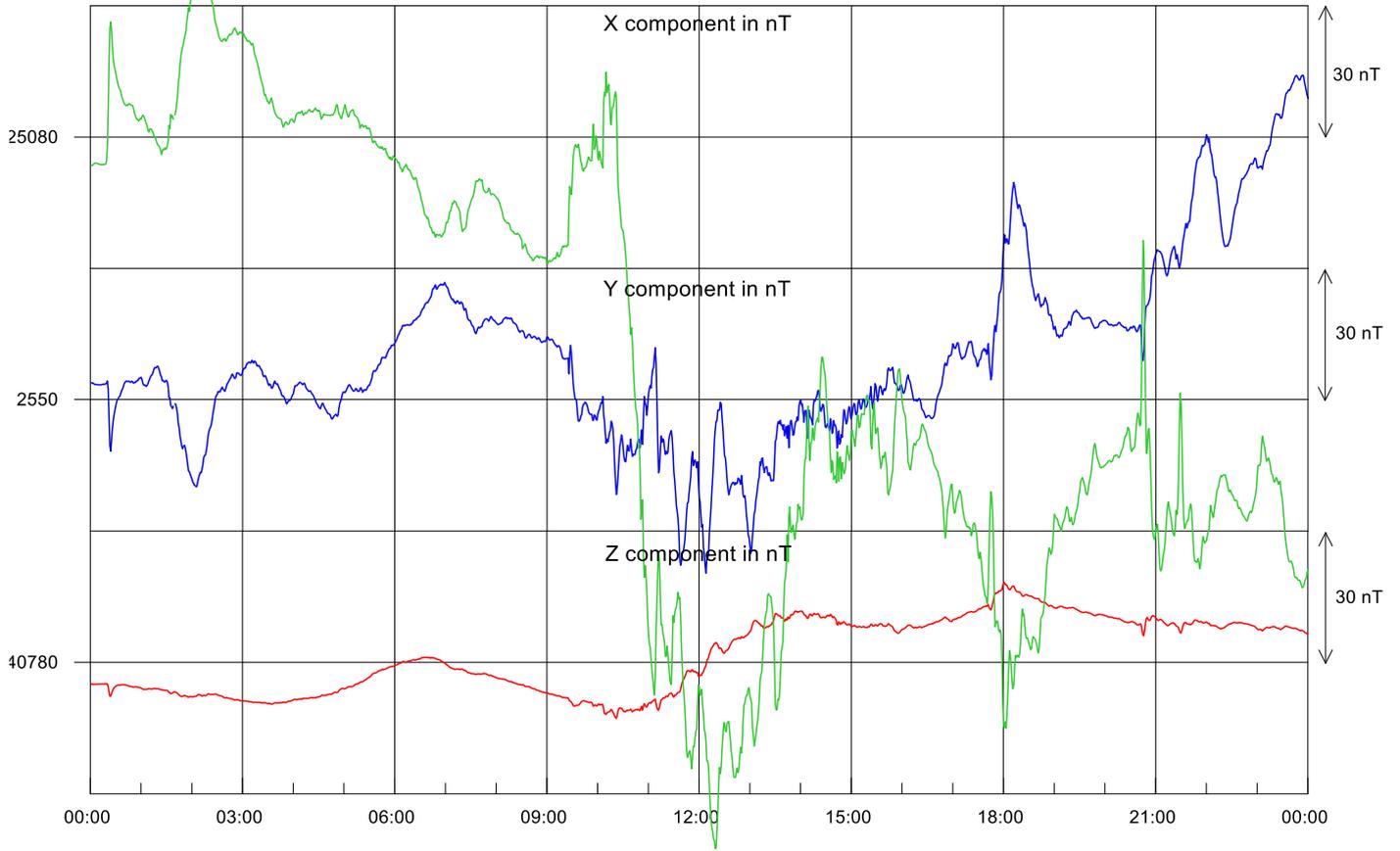
In this bulletin, geomagnetic measurement results obtained throughout December-2023 are given (Figure-1). Magnetic field values of a particular date could be obtained on request.

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Date: 01-12-2023

IZN Magnetic Observatory

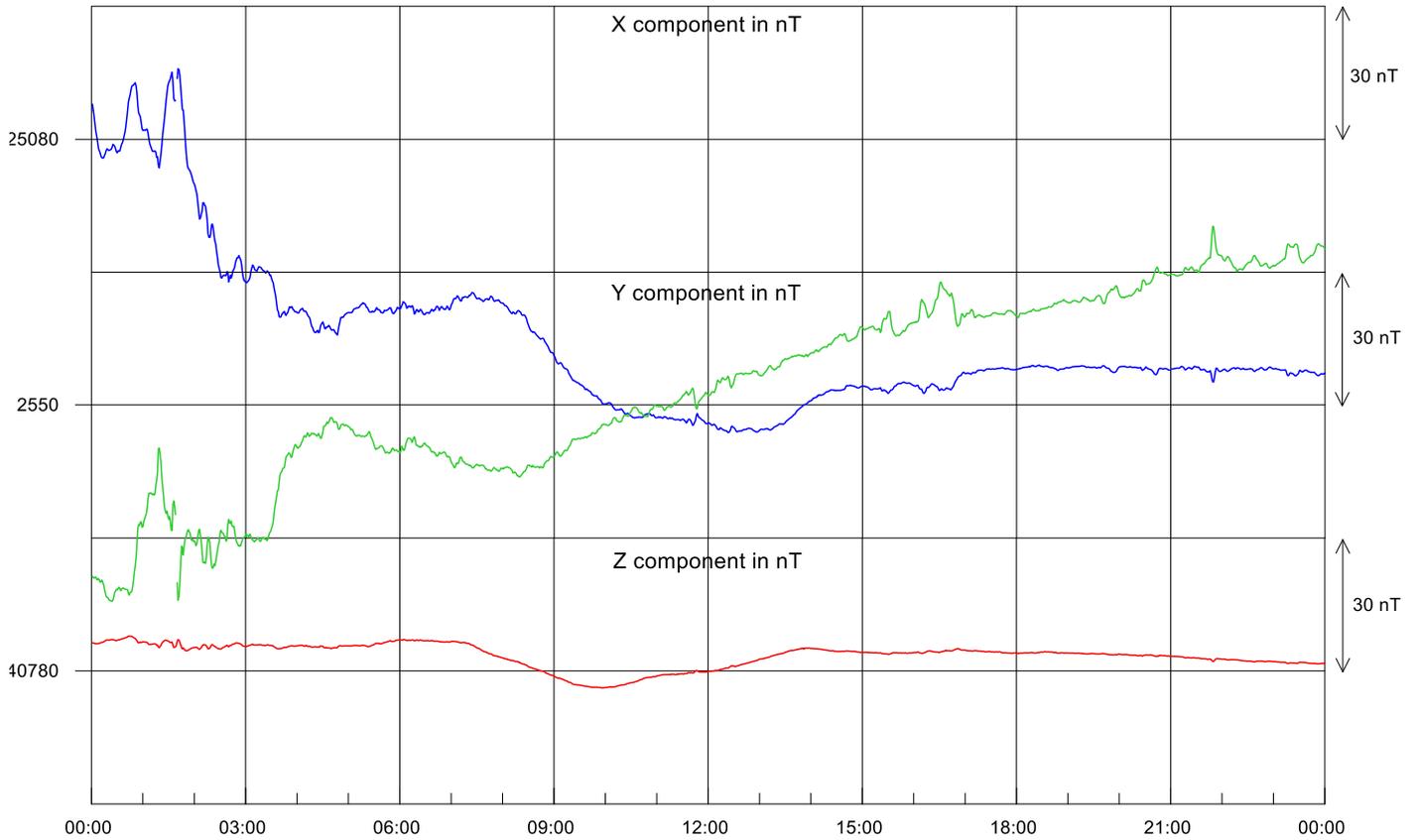
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Date: 02-12-2023

IZN Magnetic Observatory

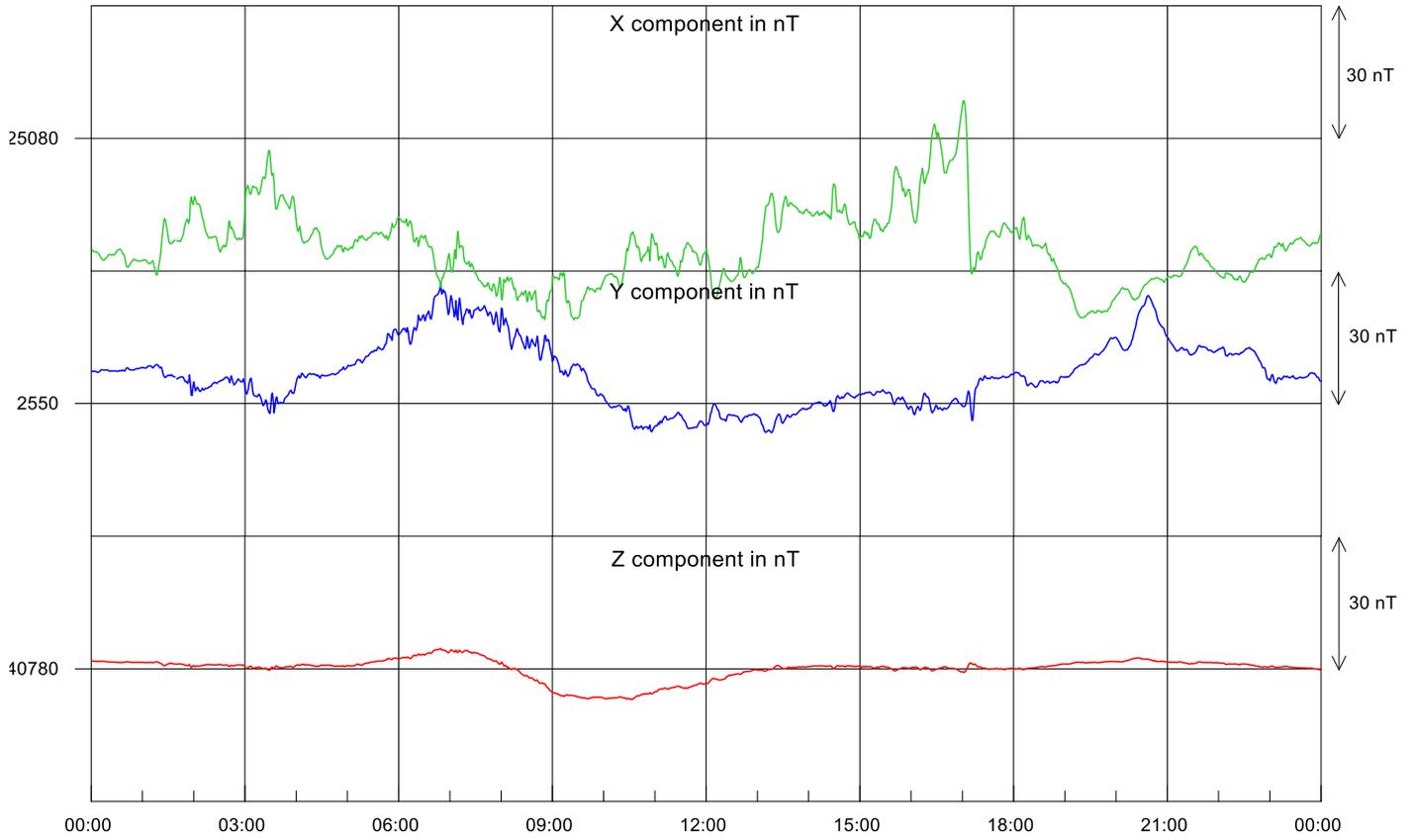
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Date: 03-12-2023

IZN Magnetic Observatory

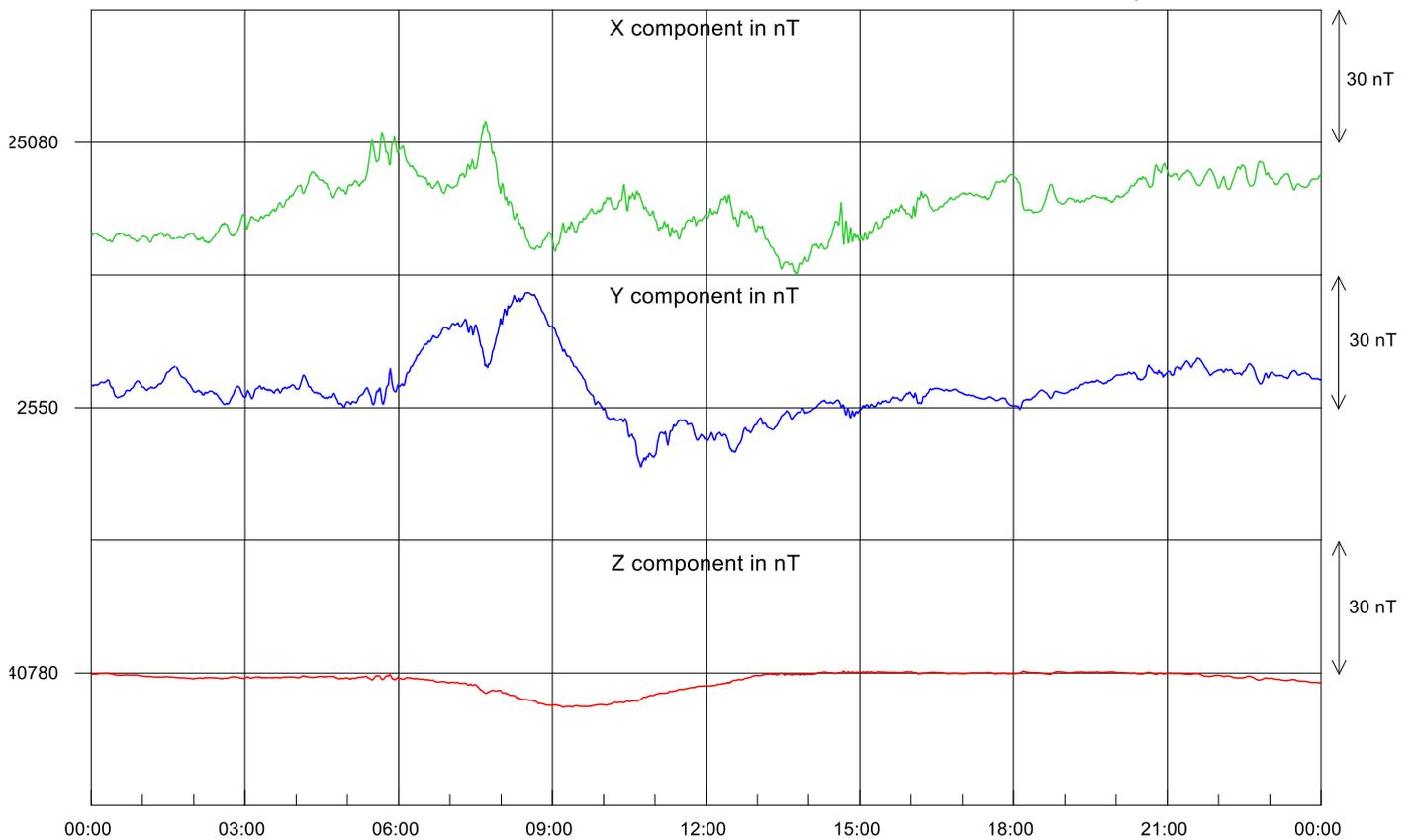
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Date: 04-12-2023

IZN Magnetic Observatory

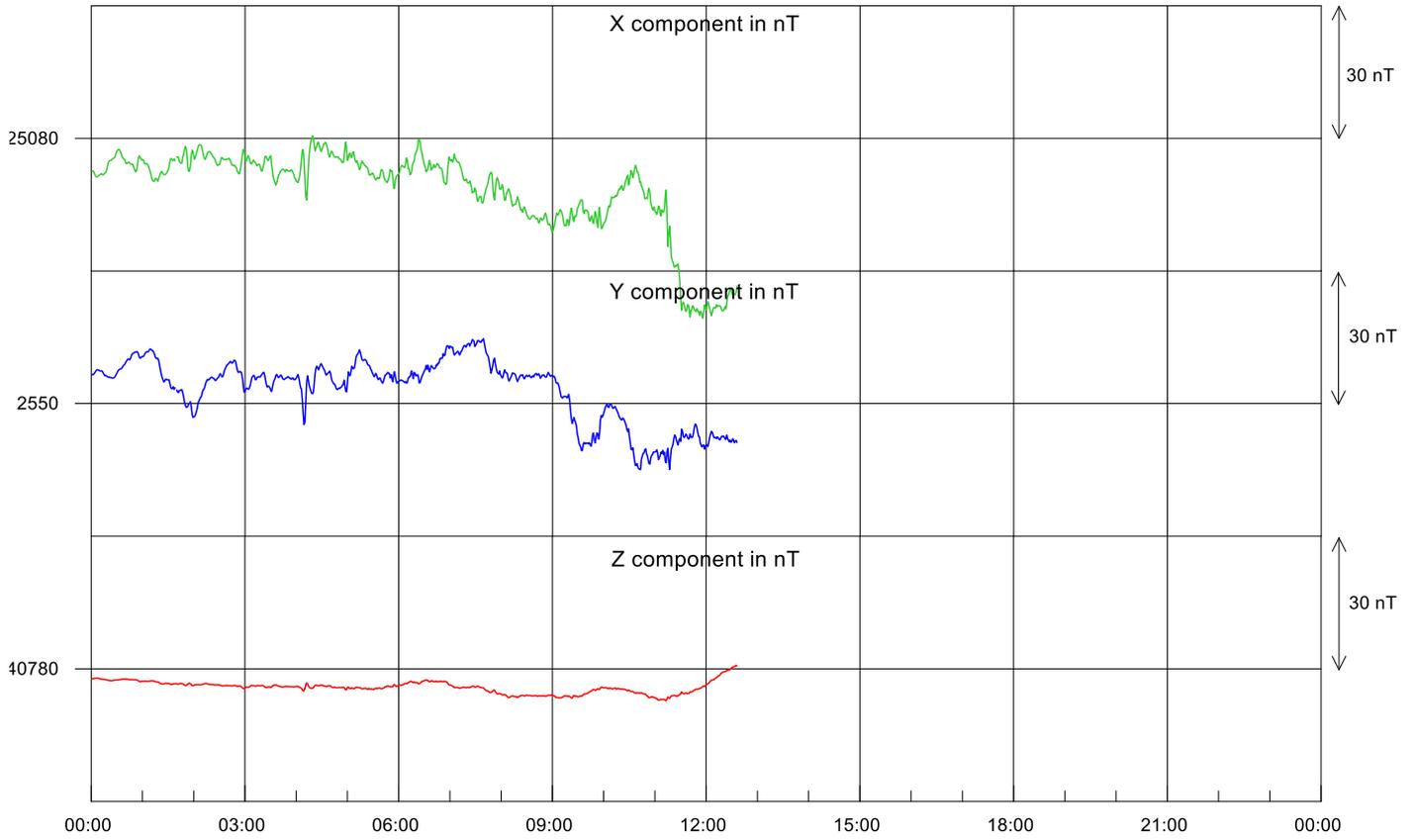
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Date: 05-12-2023

IZN Magnetic Observatory

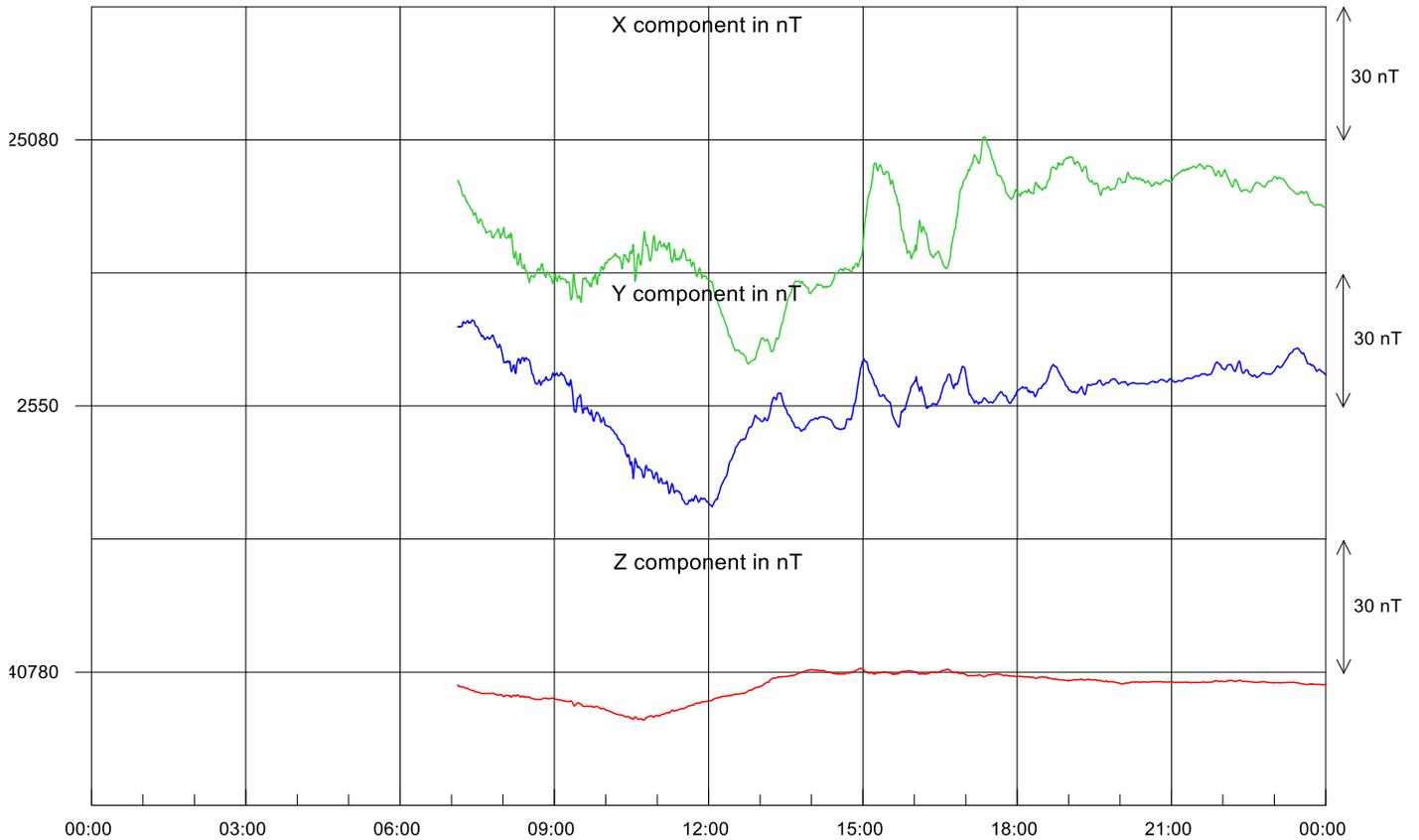
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Date: 06-12-2023

IZN Magnetic Observatory

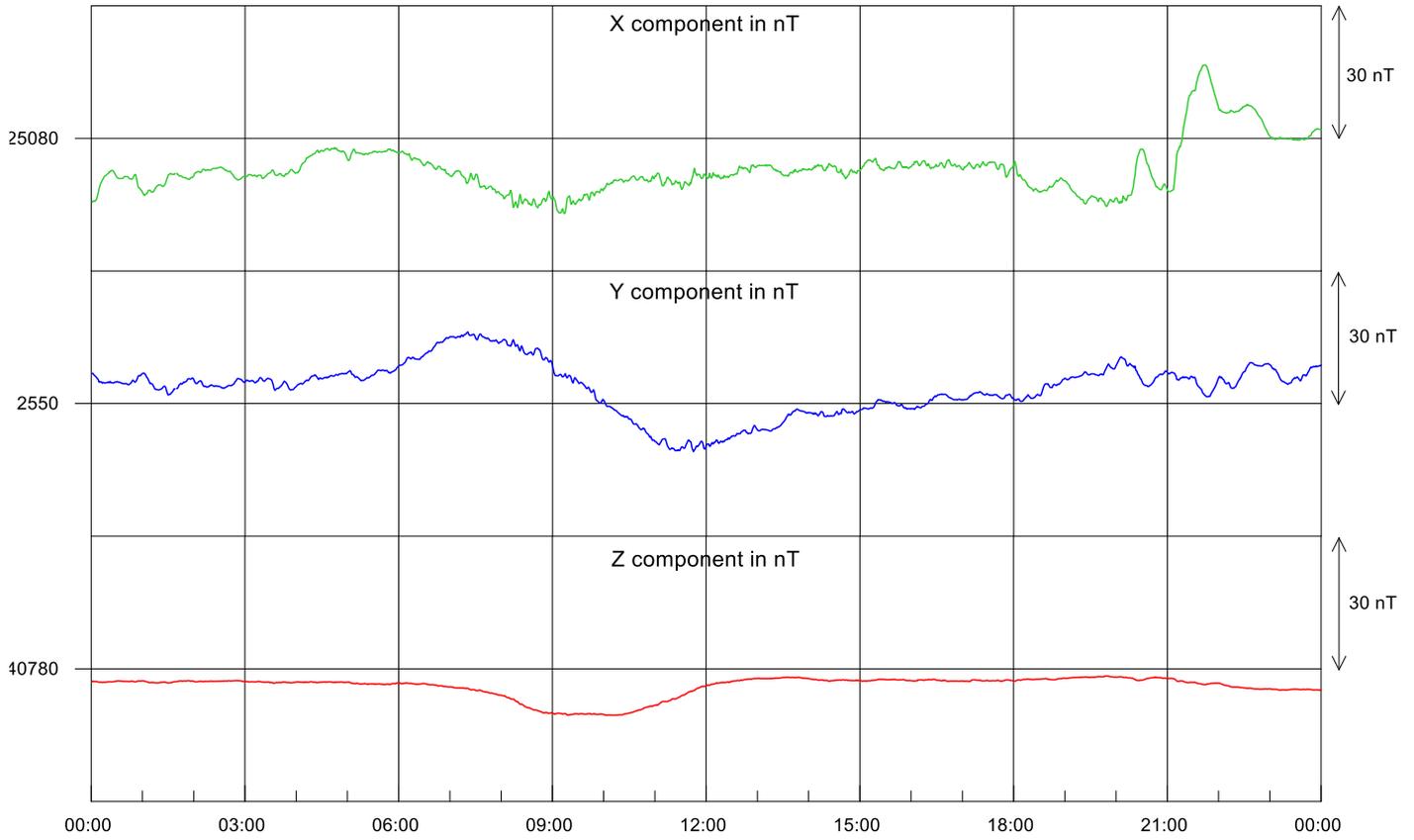
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Date: 07-12-2023

IZN Magnetic Observatory

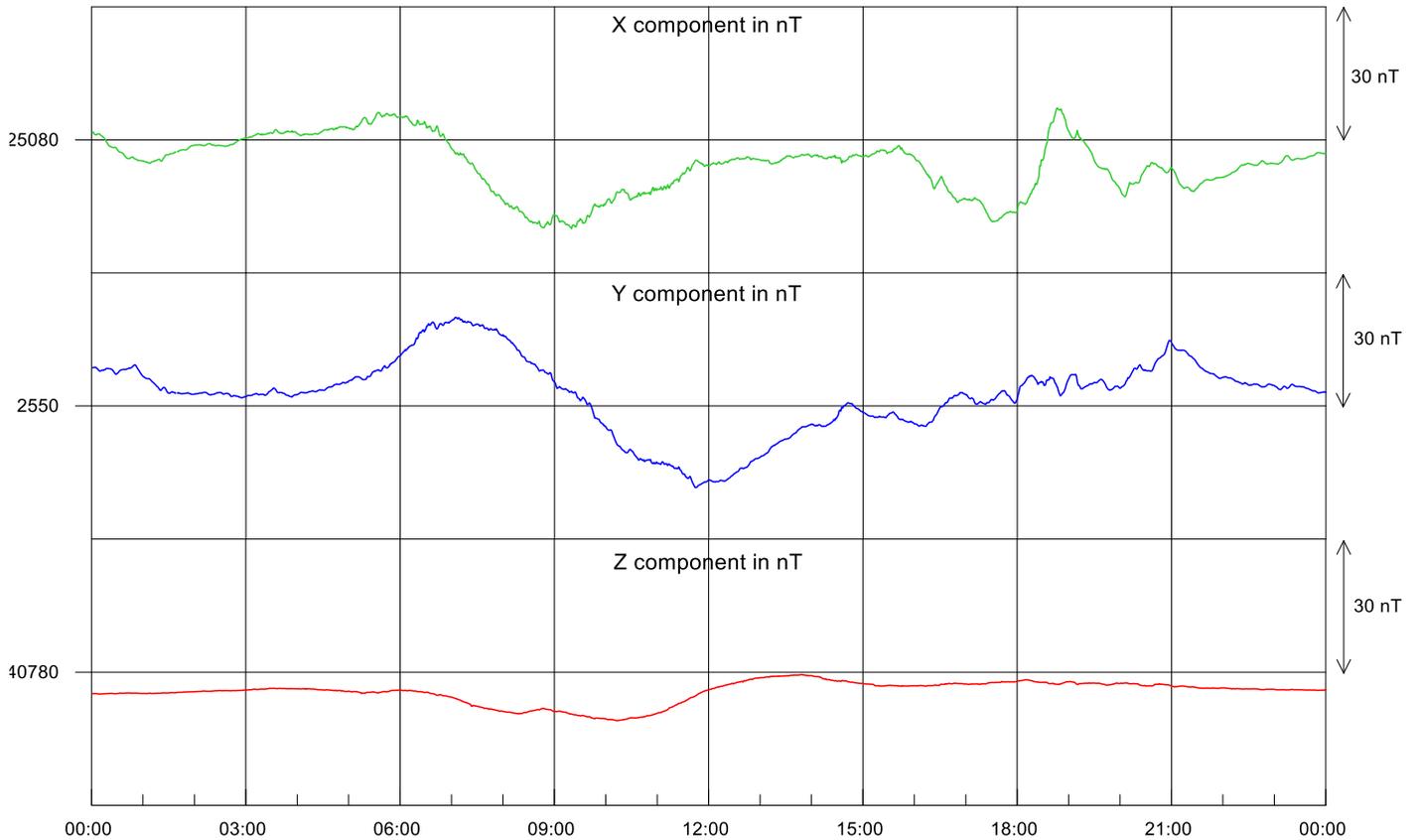
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Date: 08-12-2023

IZN Magnetic Observatory

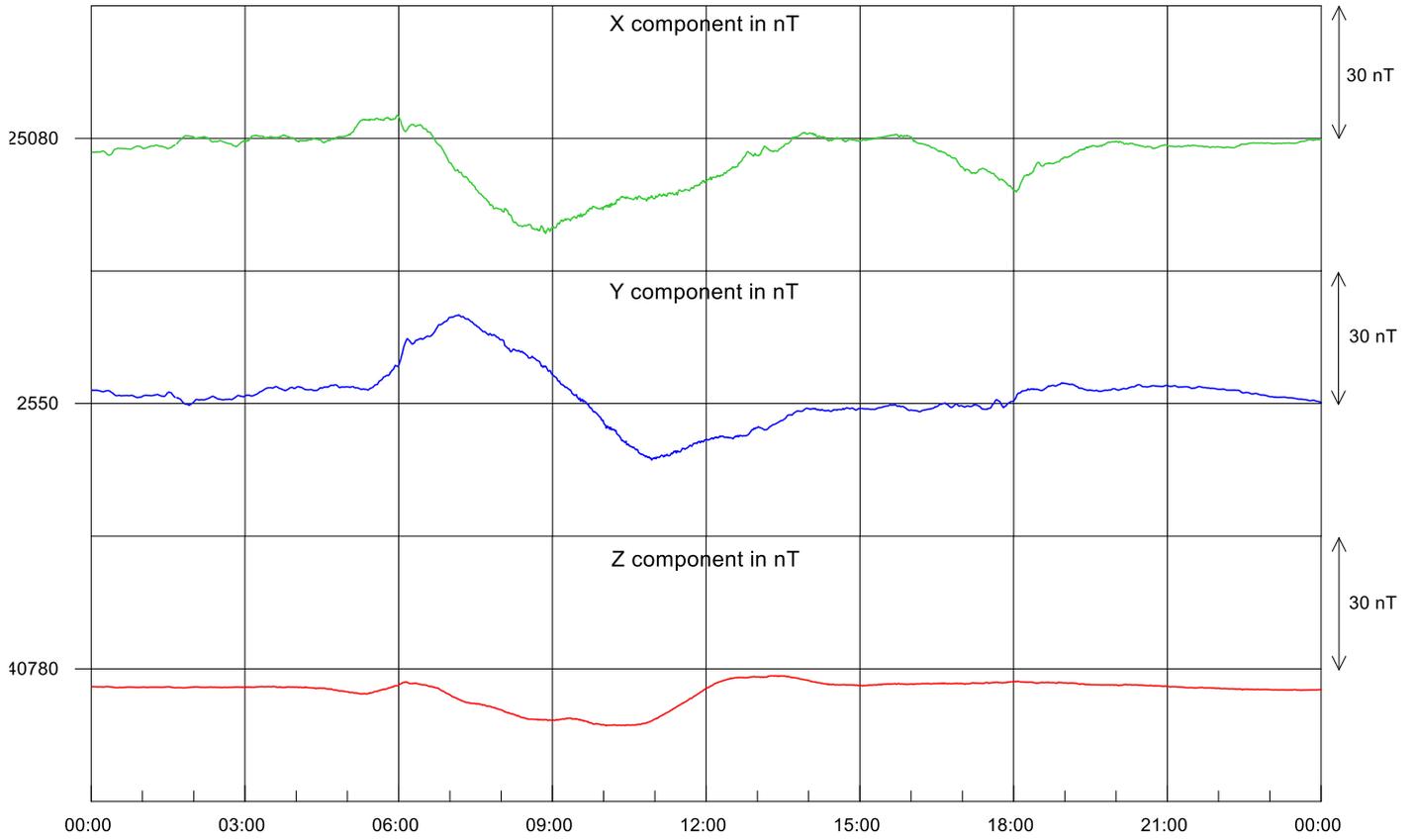
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Date: 09-12-2023

IZN Magnetic Observatory

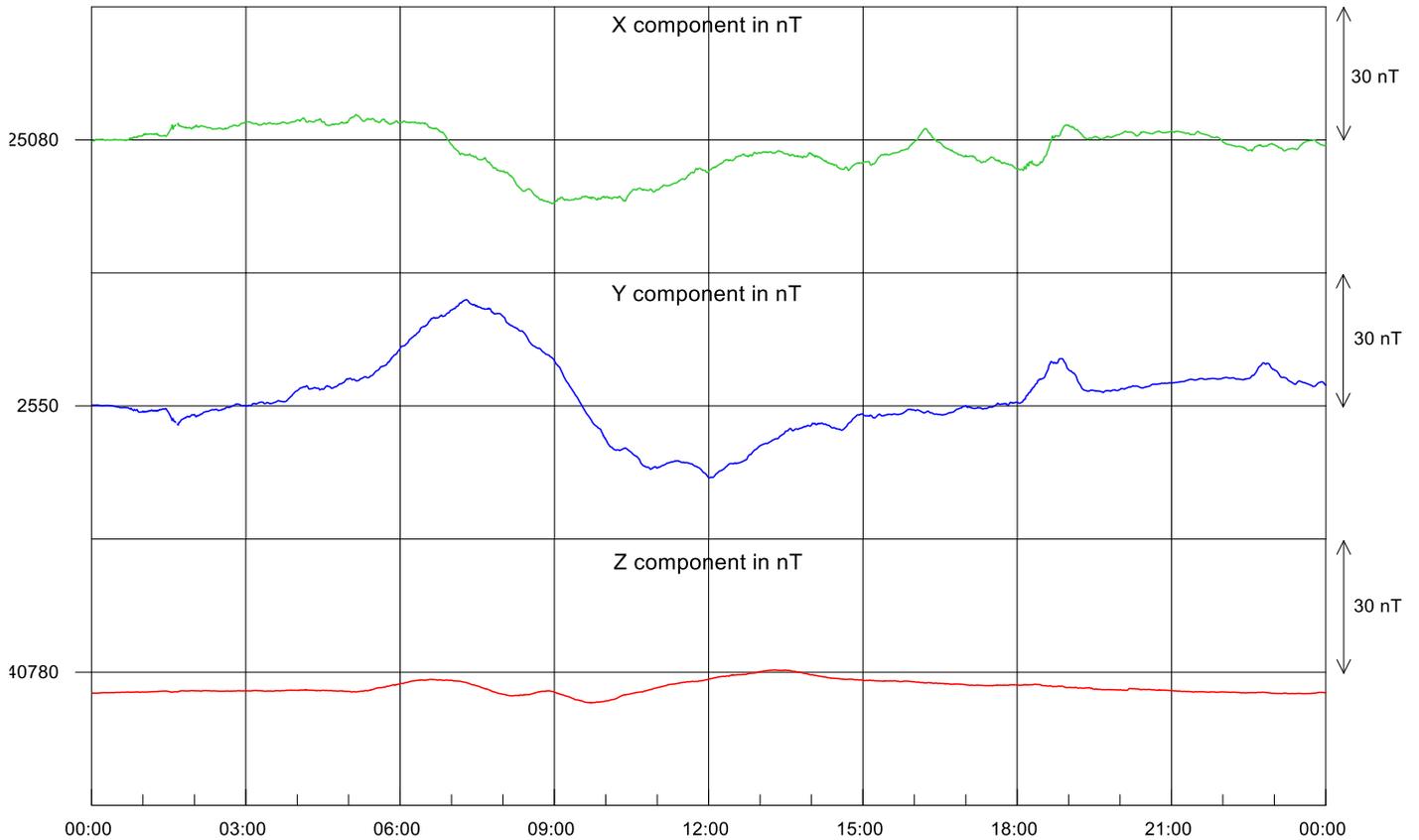
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Date: 10-12-2023

IZN Magnetic Observatory

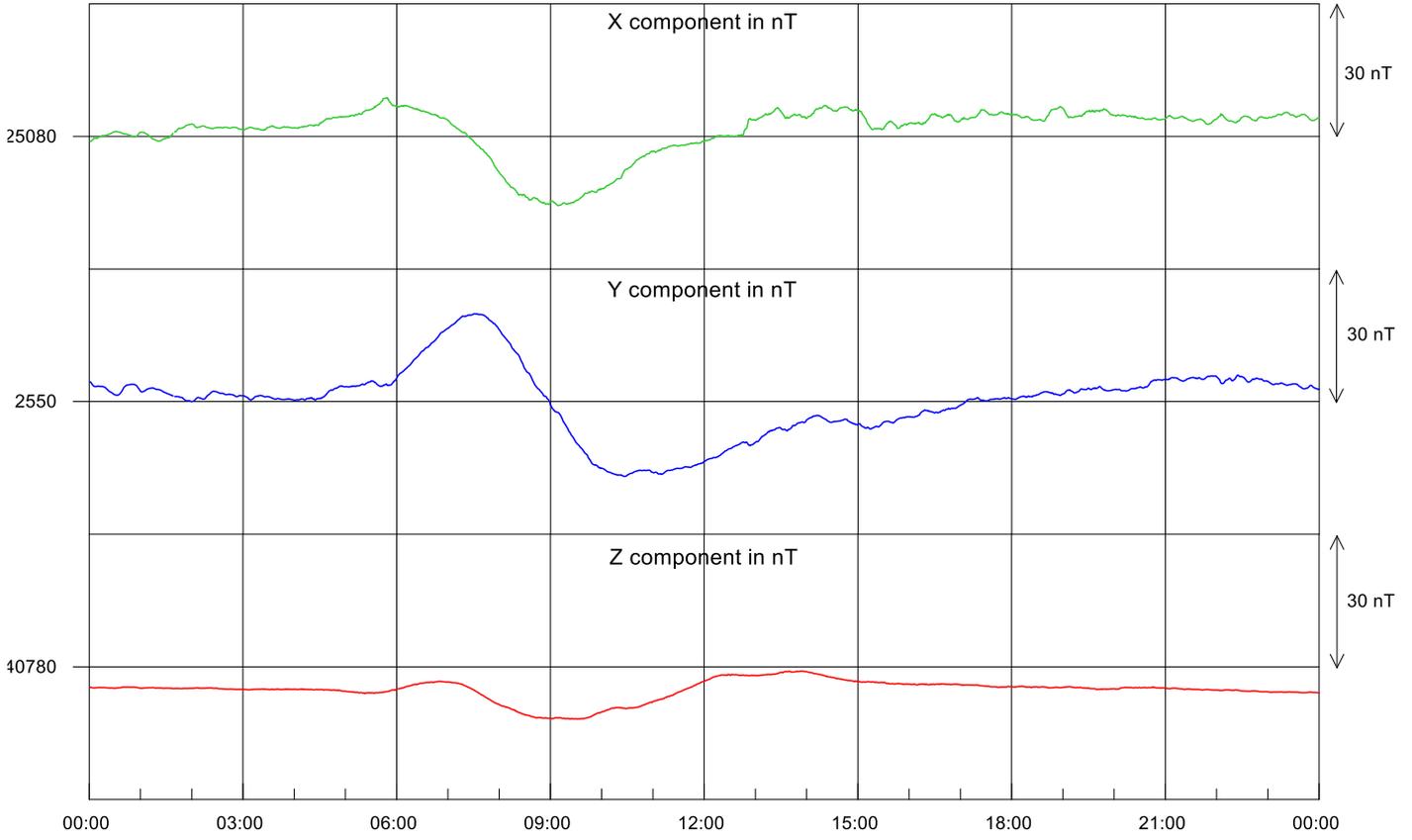
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Date: 11-12-2023

IZN Magnetic Observatory

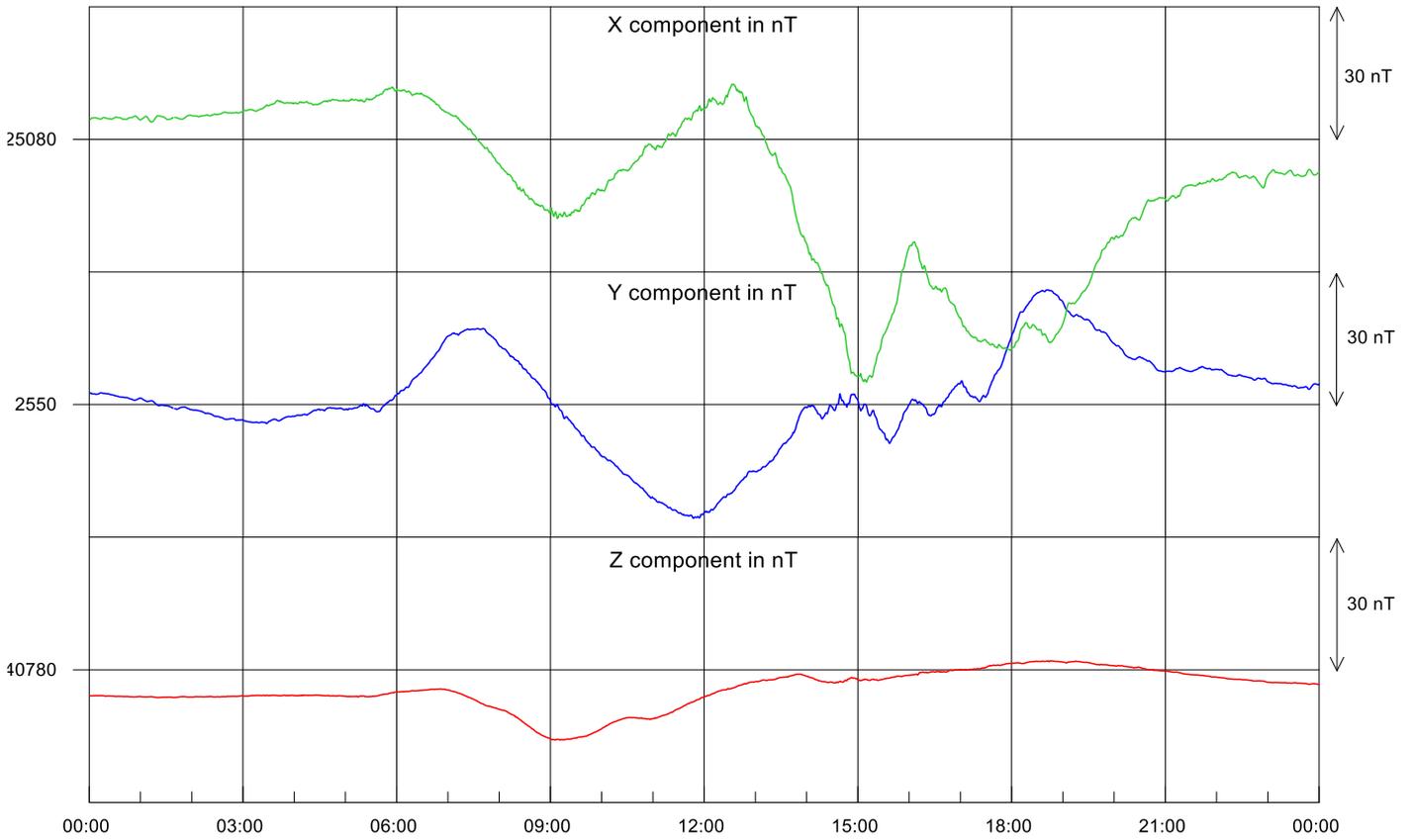
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Date: 12-12-2023

IZN Magnetic Observatory

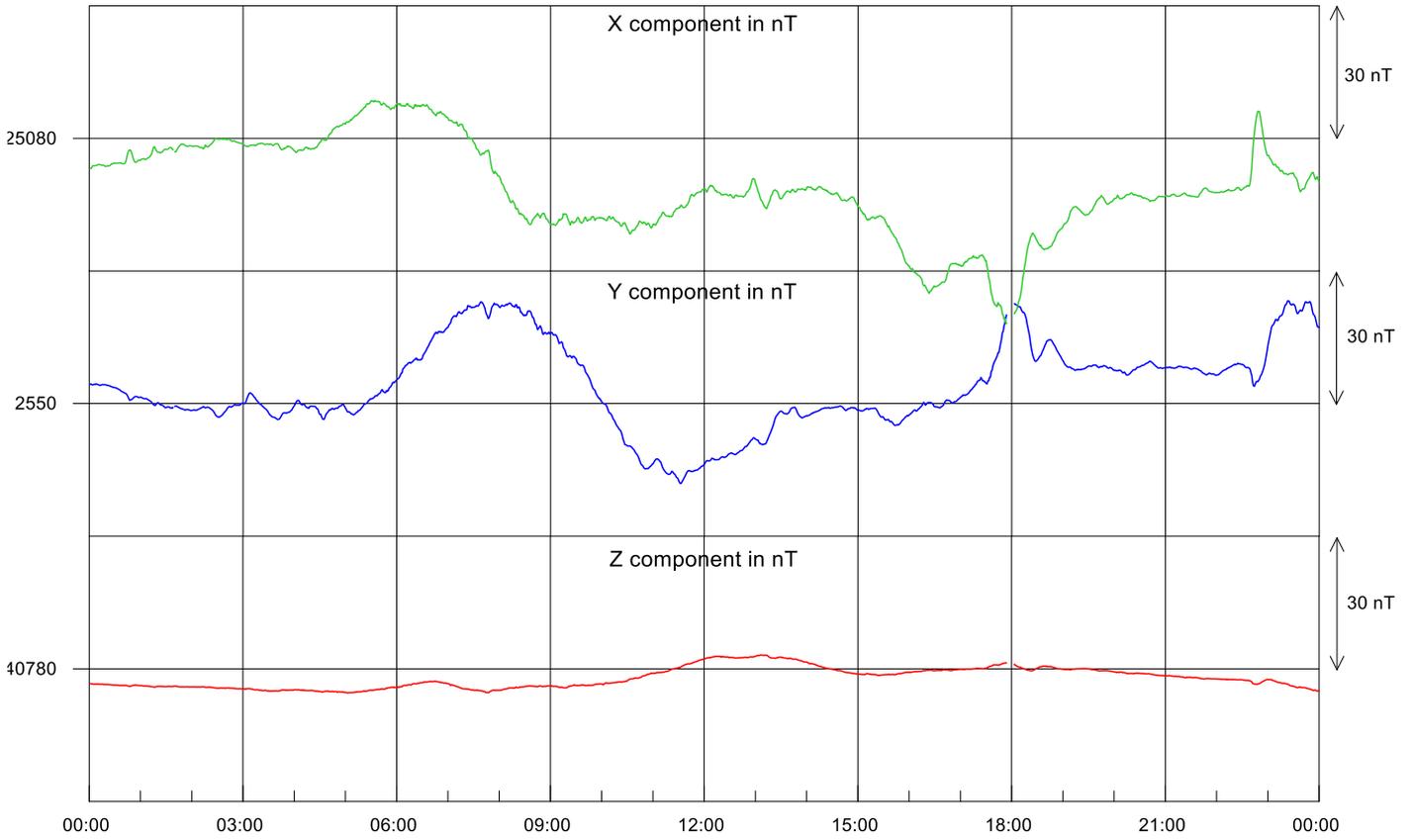
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Date: 13-12-2023

IZN Magnetic Observatory

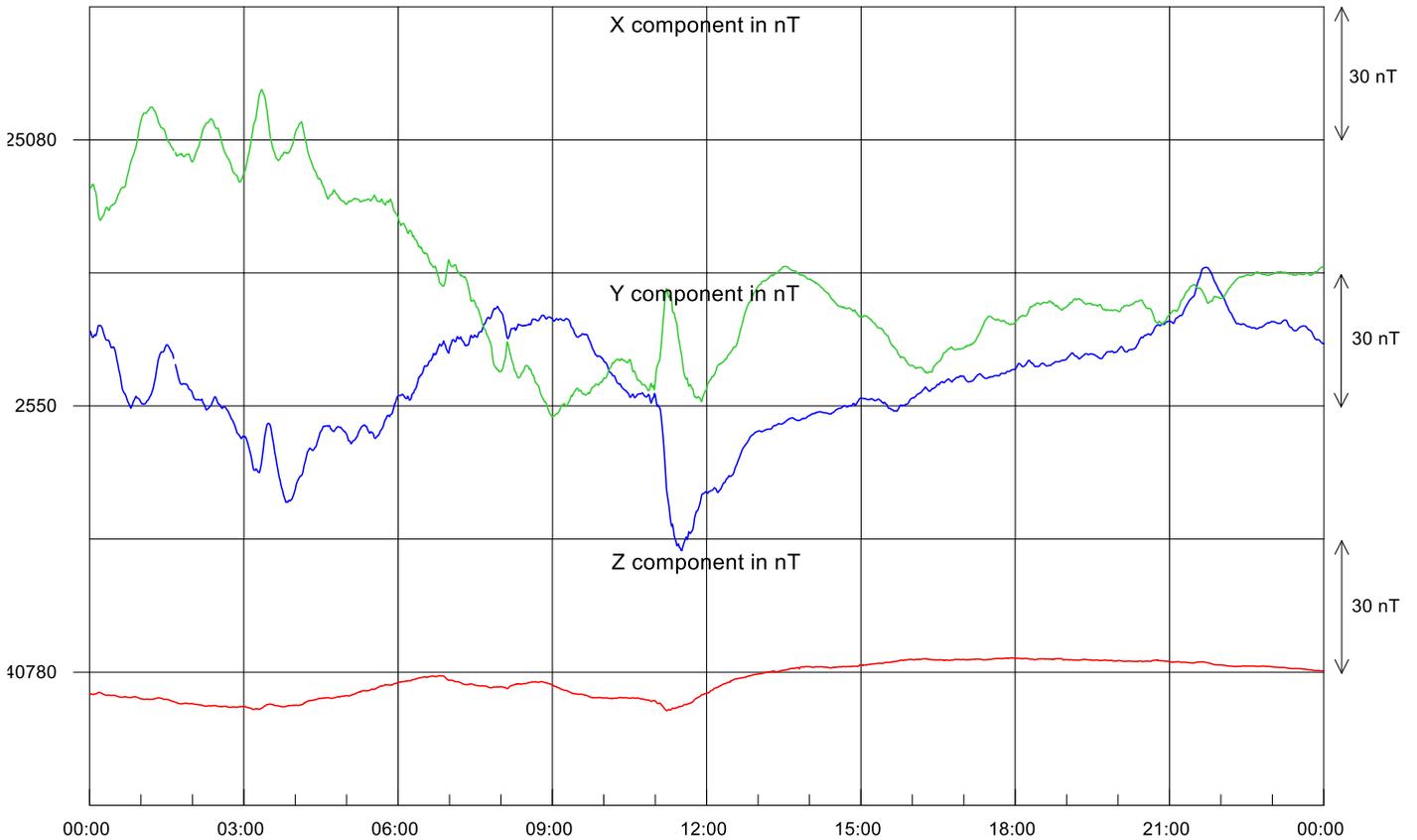
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IZN Magnetic Observatory

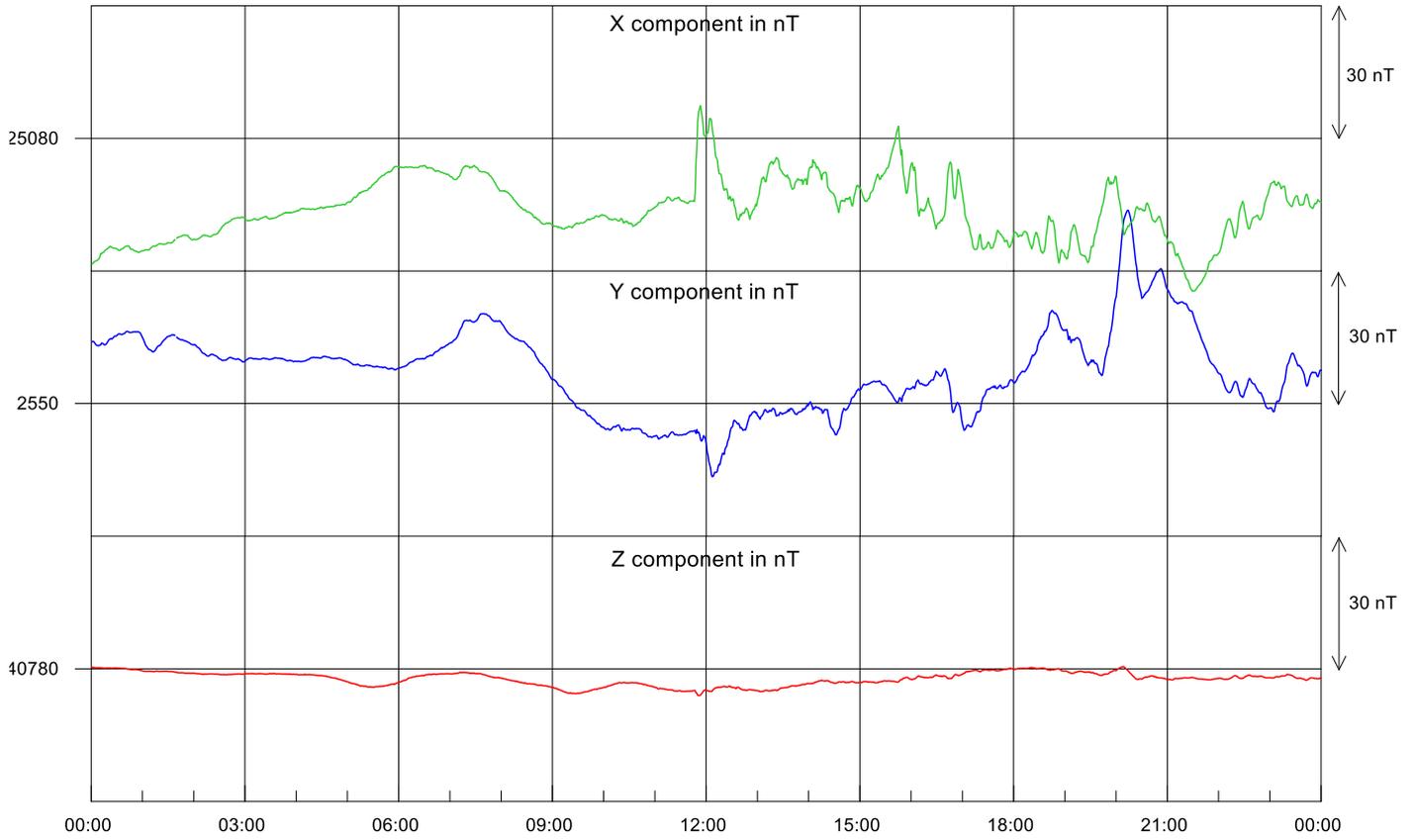
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Date: 15-12-2023

IZN Magnetic Observatory

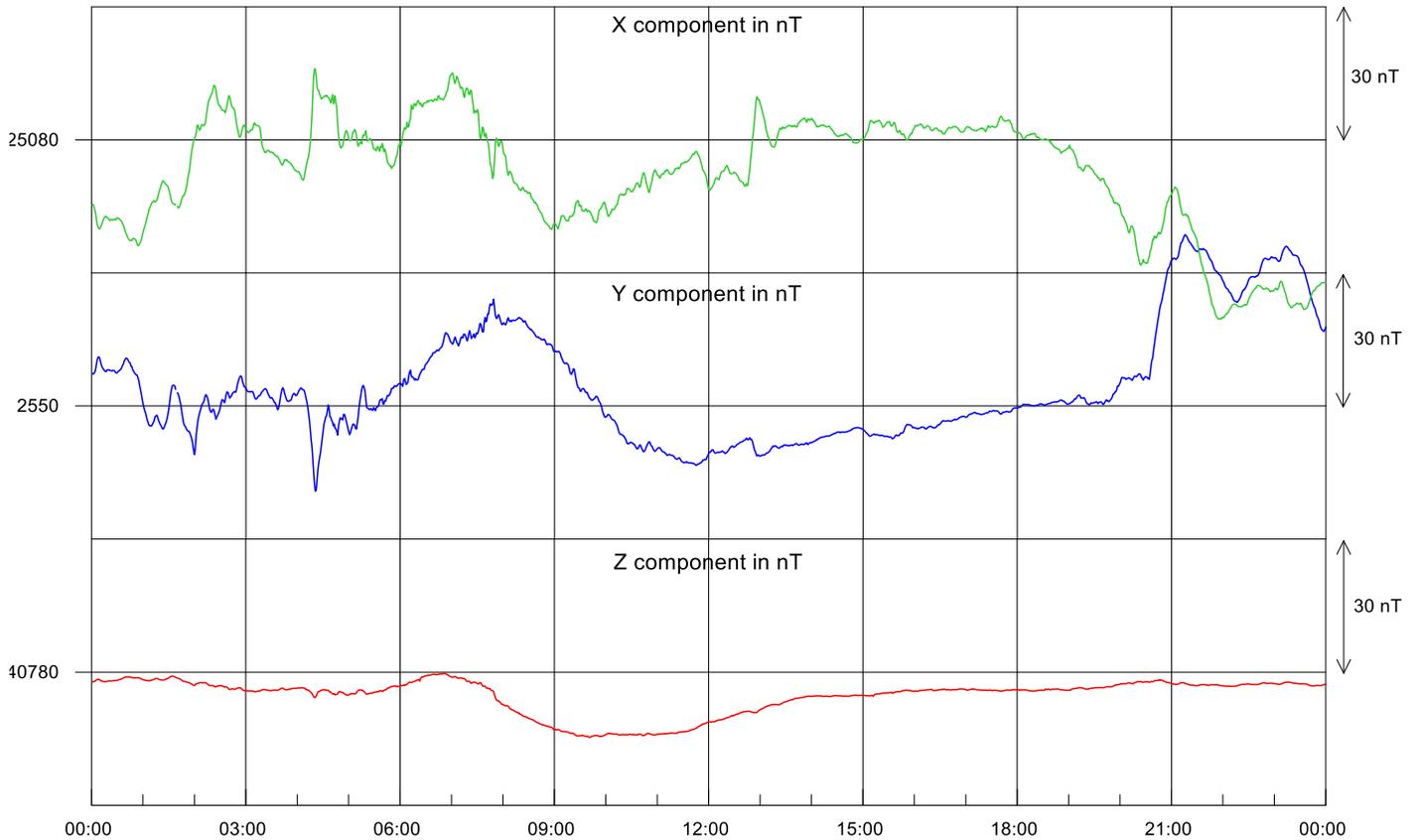
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IZN Magnetic Observatory

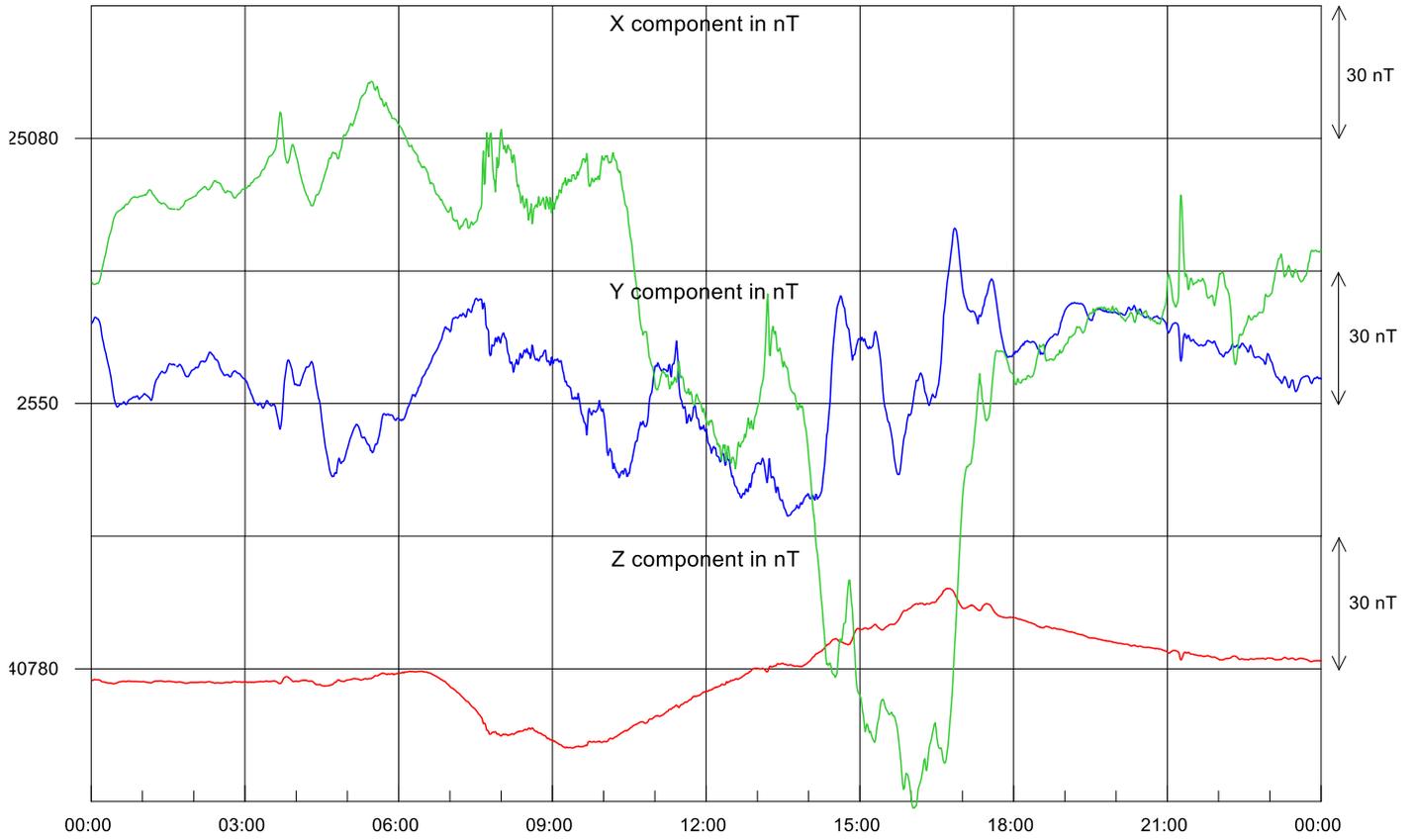
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Date: 17-12-2023

IZN Magnetic Observatory

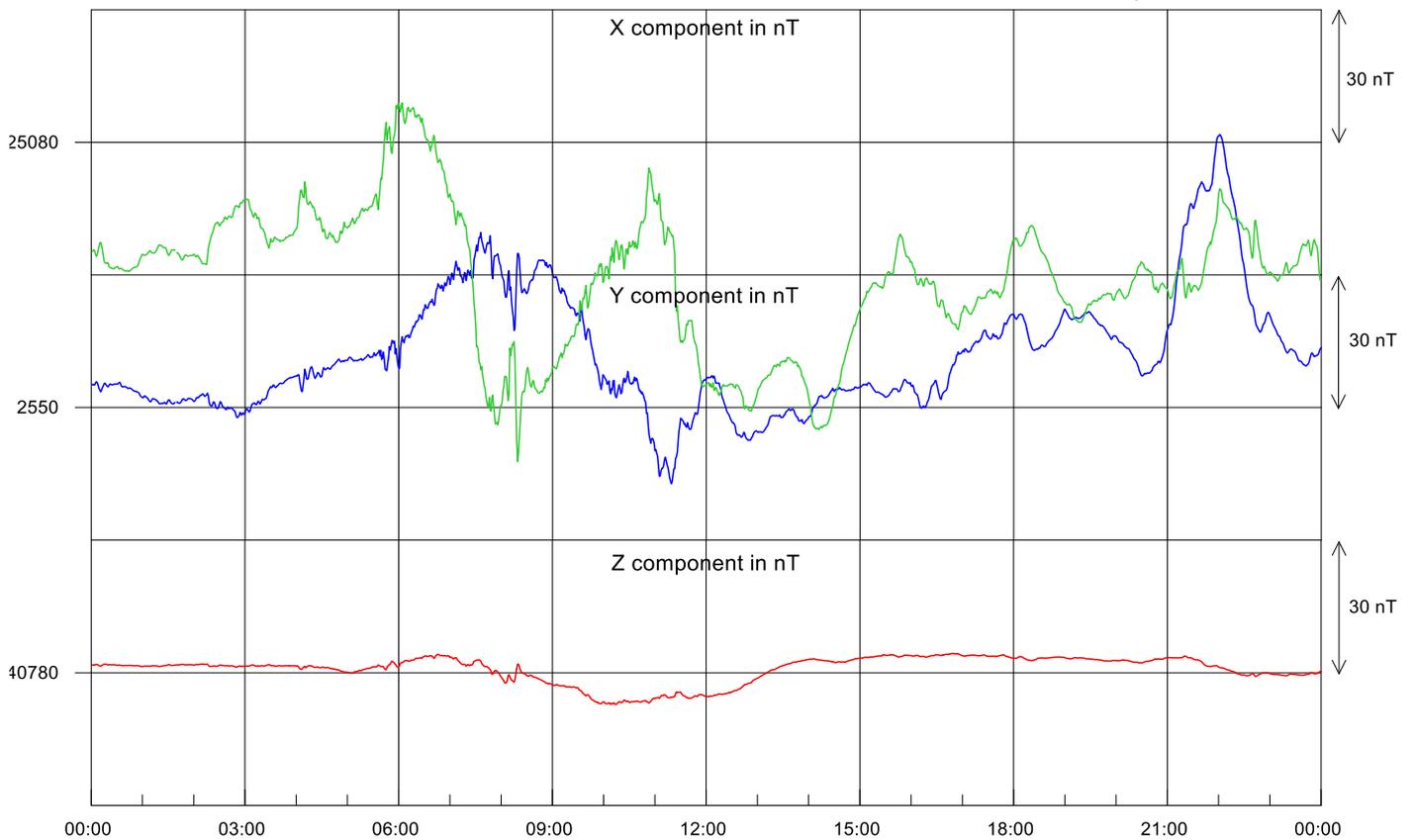
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IZN Magnetic Observatory

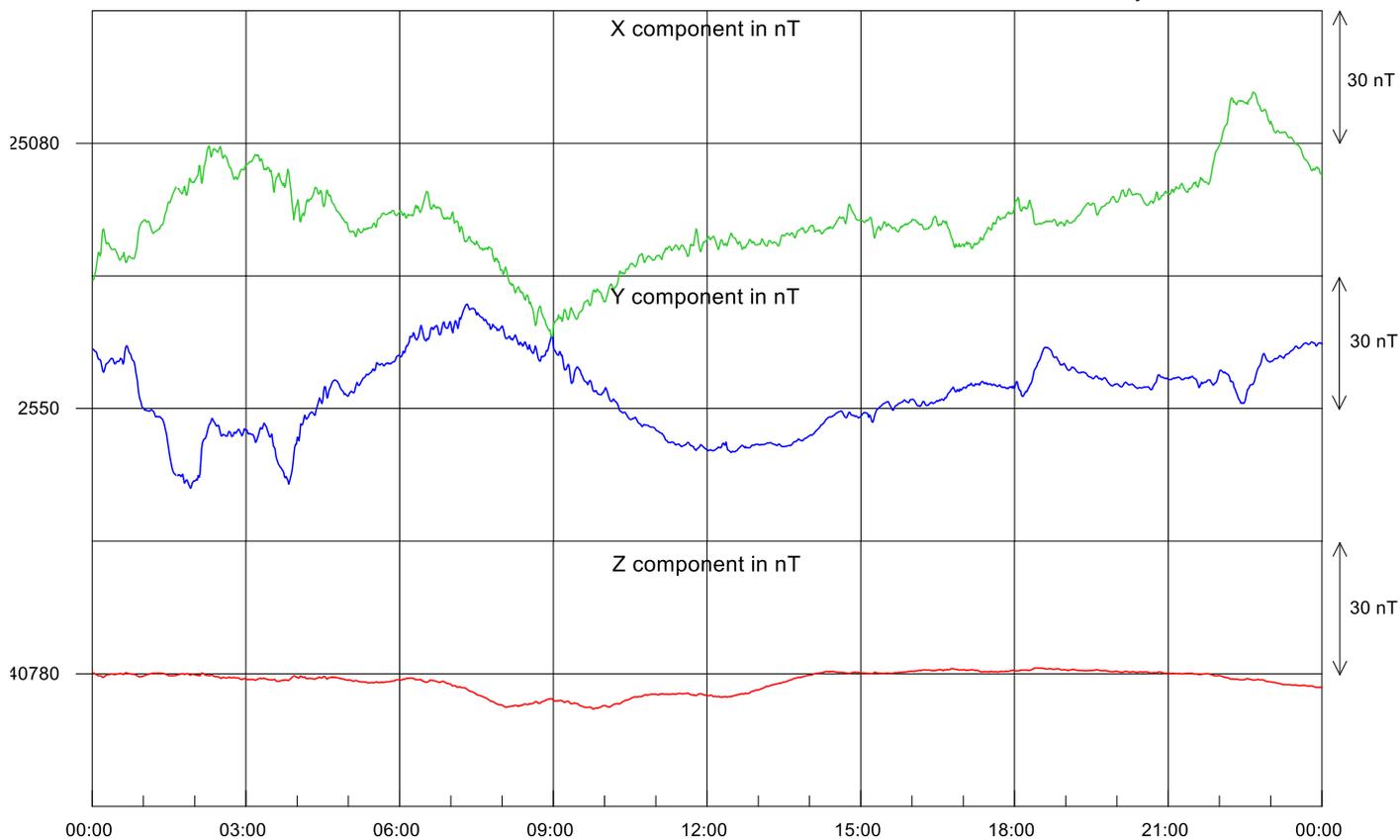
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Date: 19-12-2023

IZN Magnetic Observatory

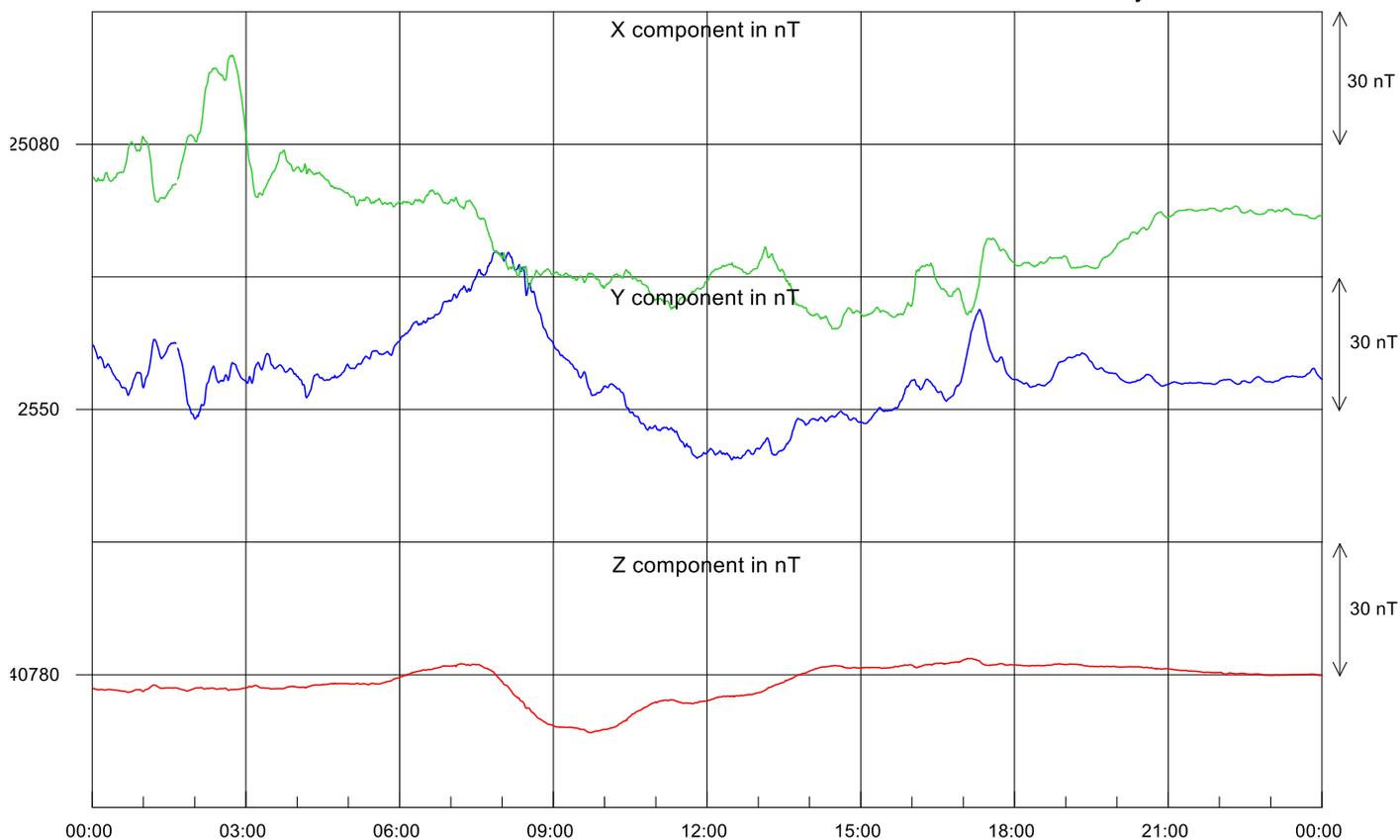
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Date: 20-12-2023

IZN Magnetic Observatory

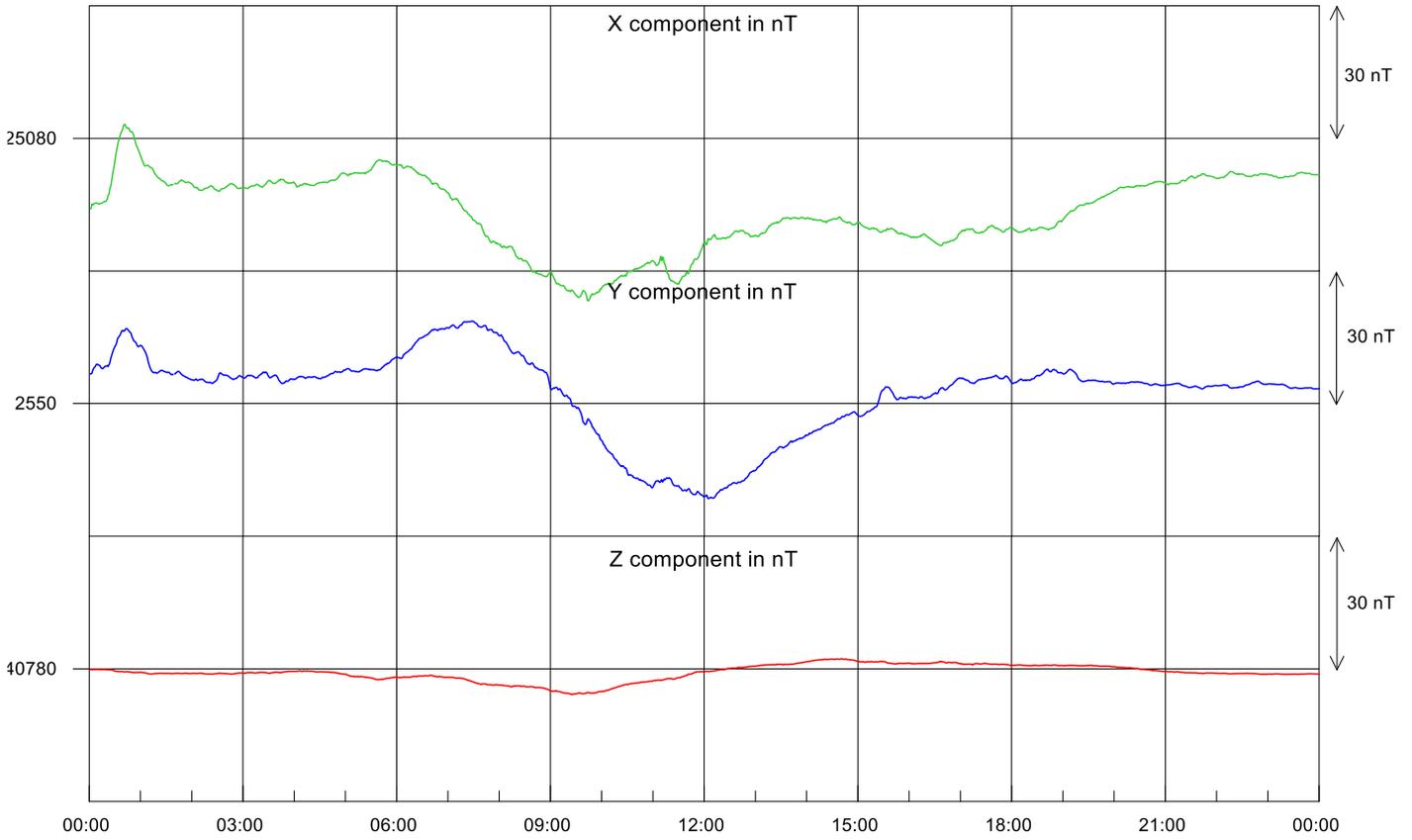
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Date: 21-12-2023

IZN Magnetic Observatory

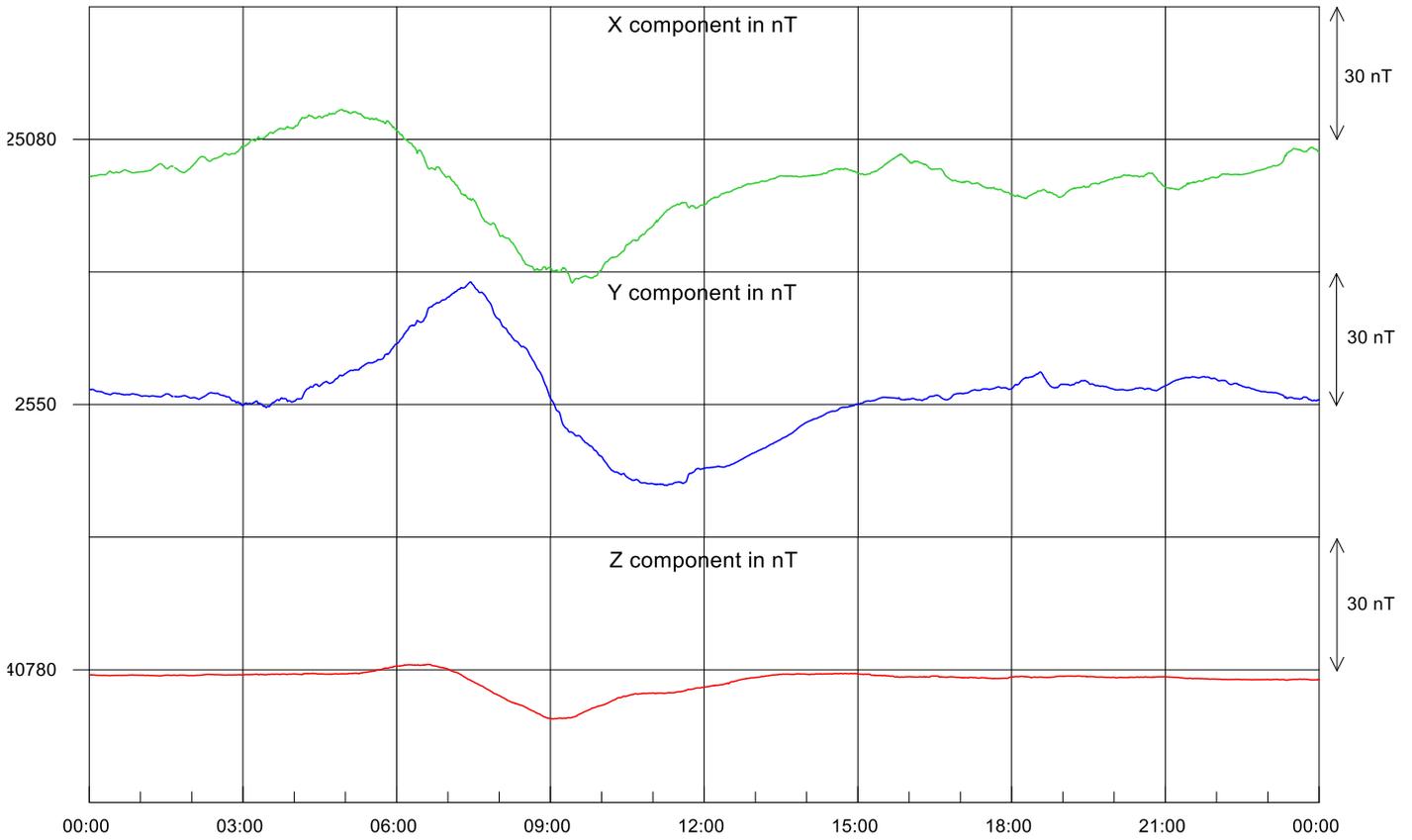
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Date: 22-12-2023

IZN Magnetic Observatory

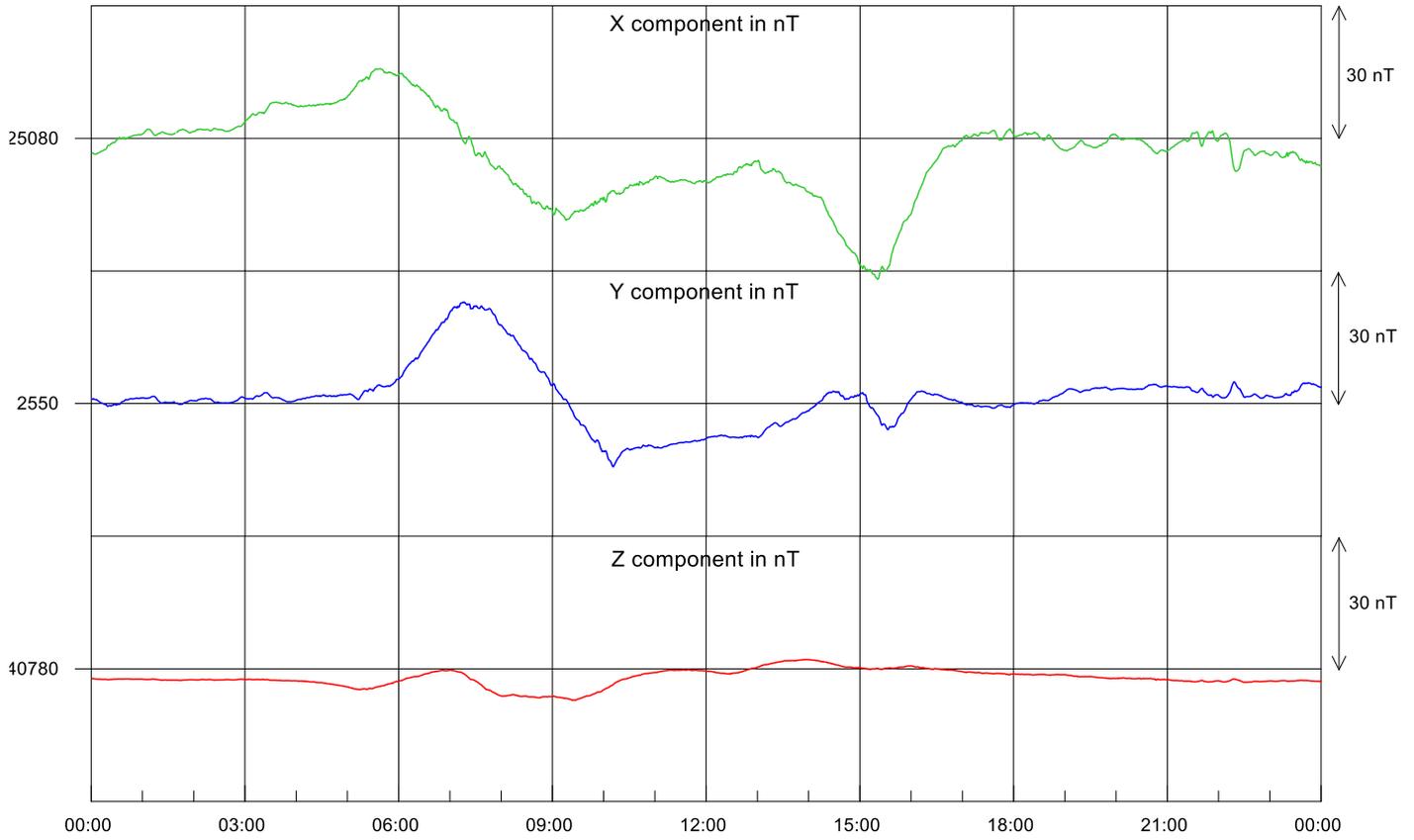
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Date: 23-12-2023

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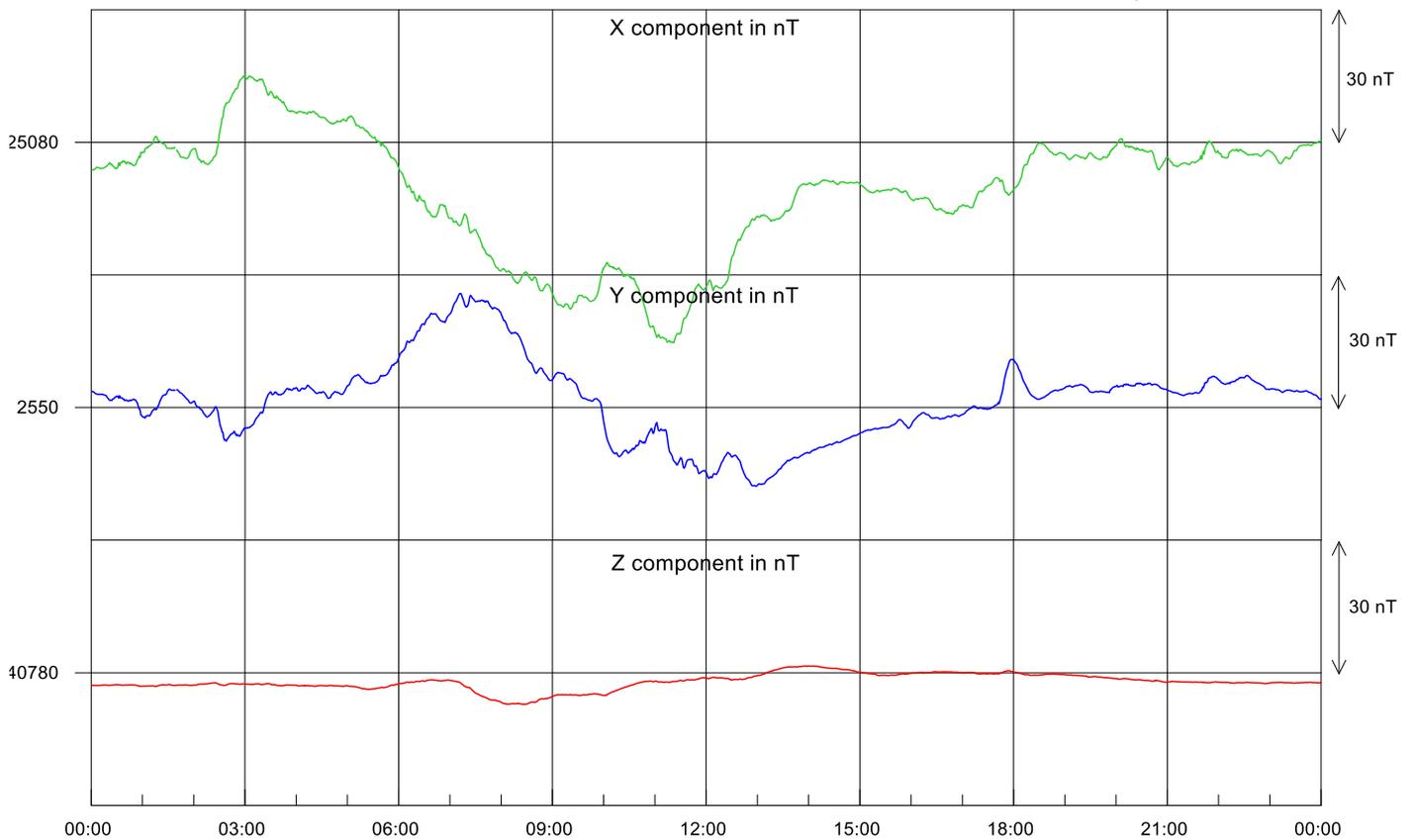
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IZN Magnetic Observatory

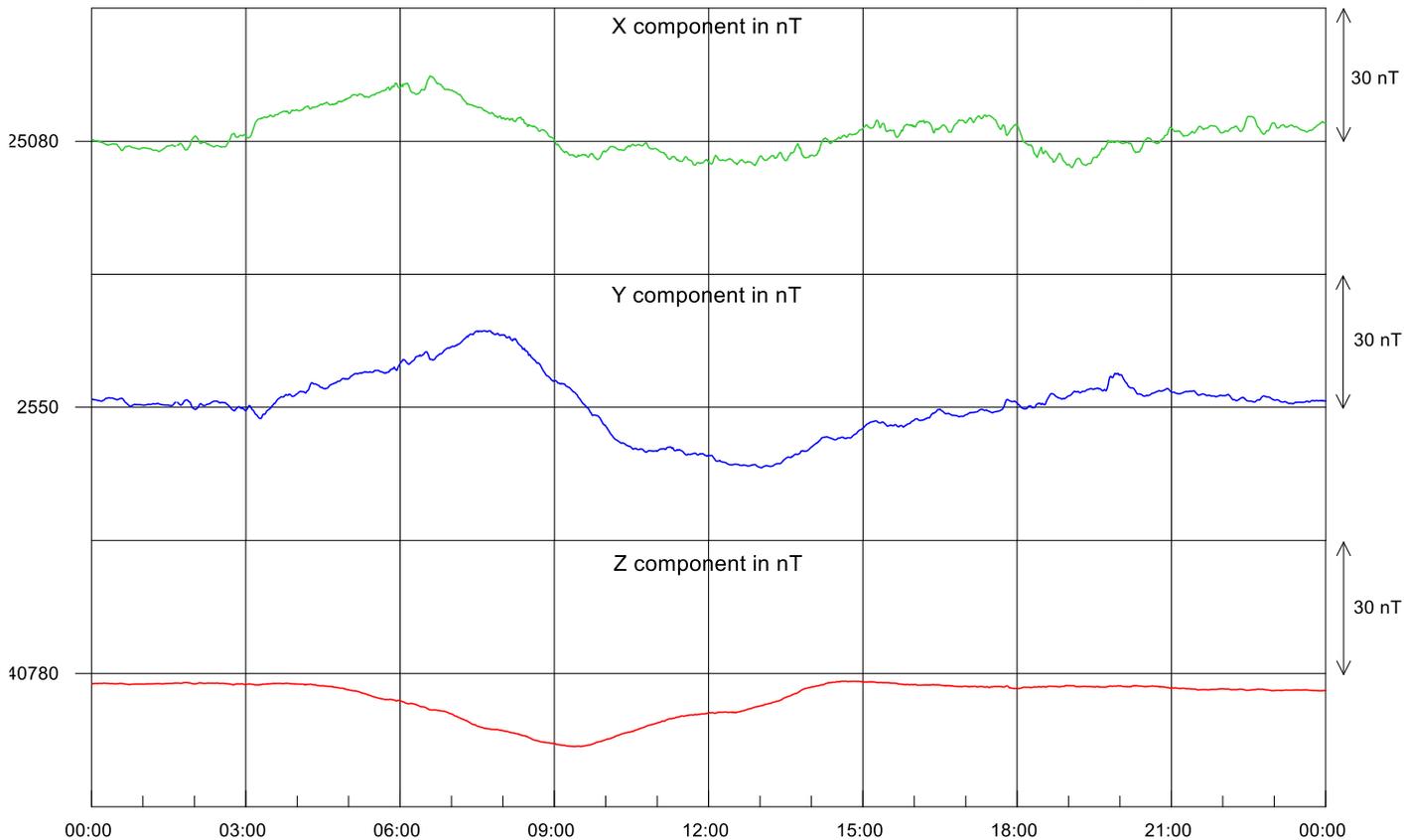
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IZN Magnetic Observatory

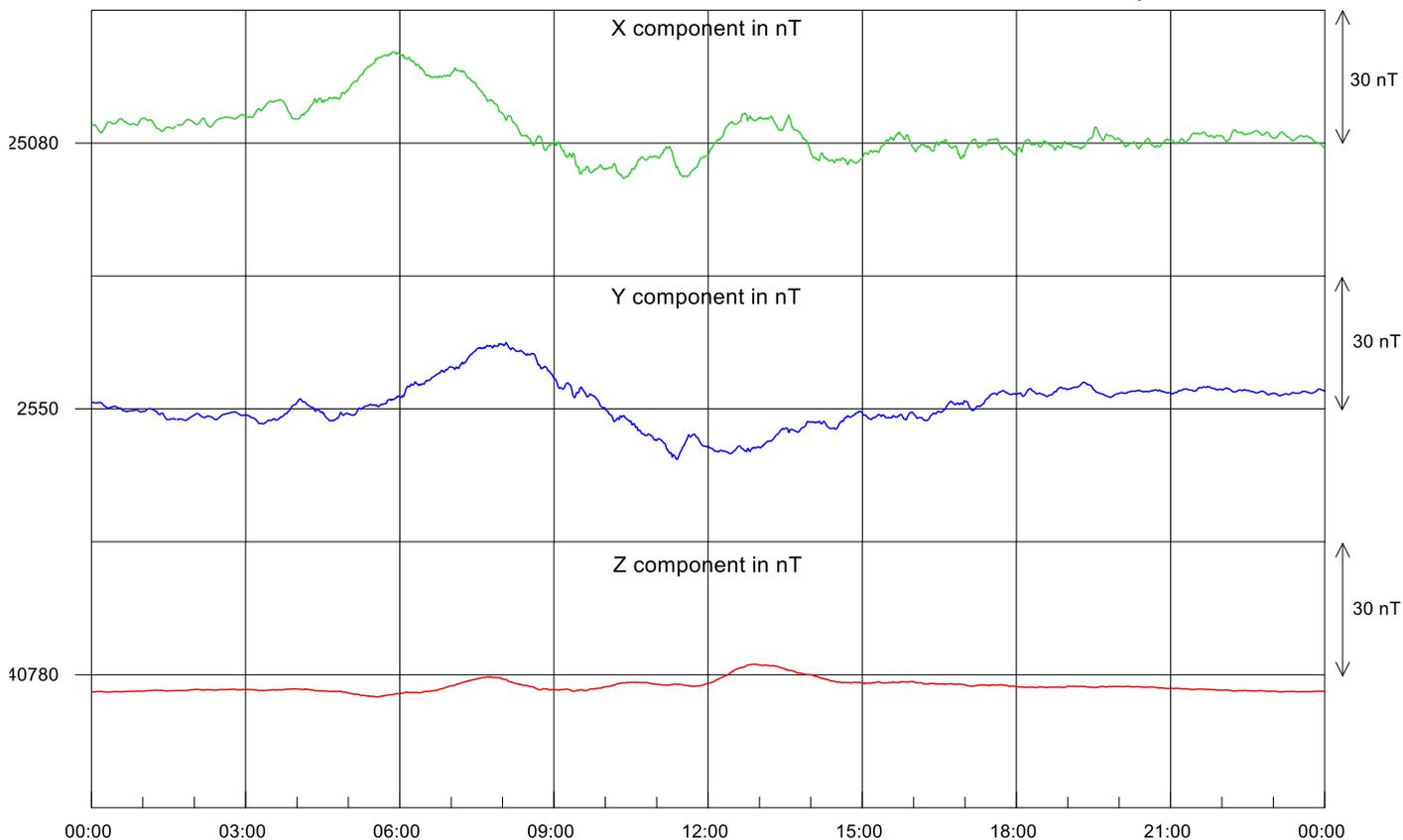
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IZN Magnetic Observatory

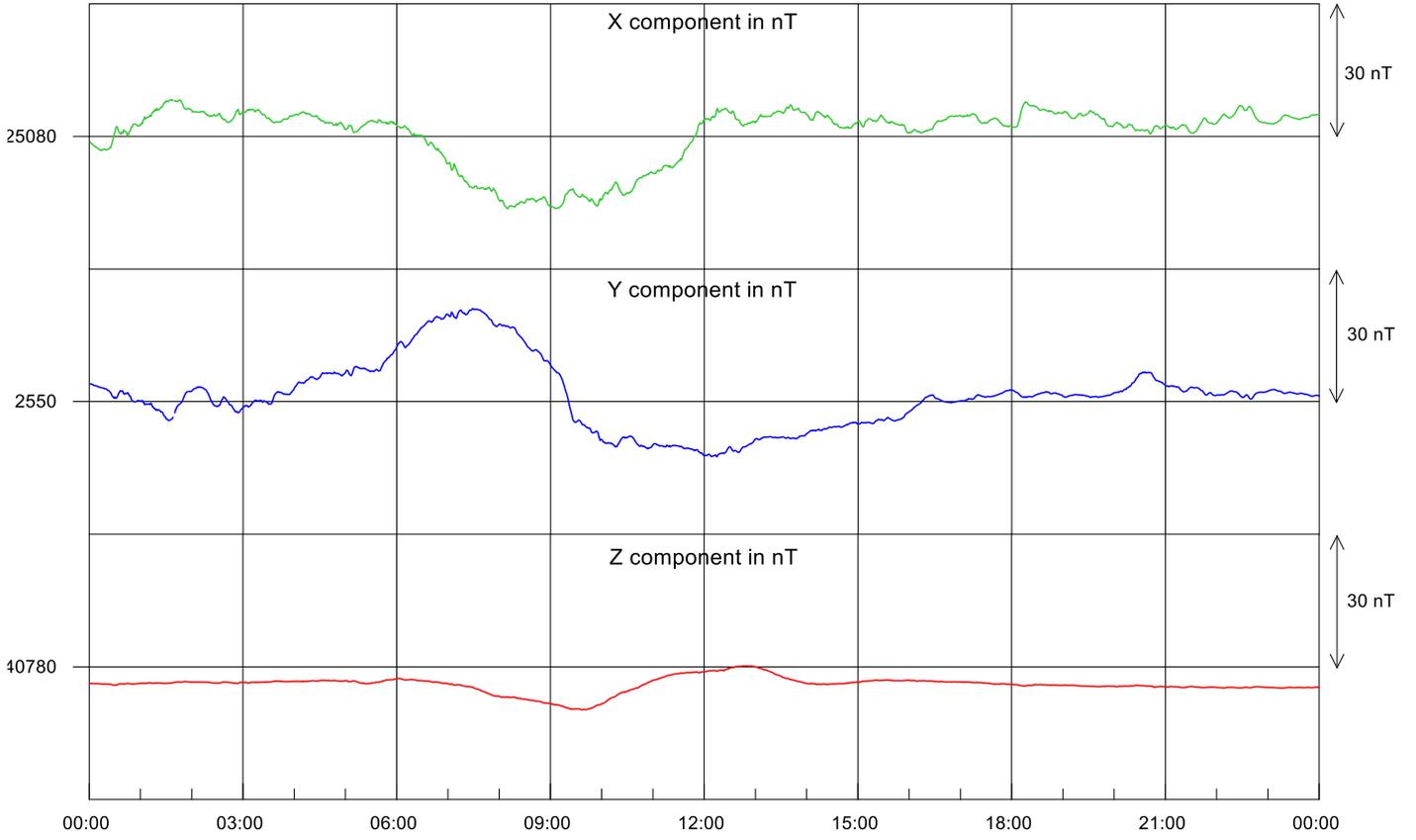
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Date: 27-12-2023

IZN Magnetic Observatory

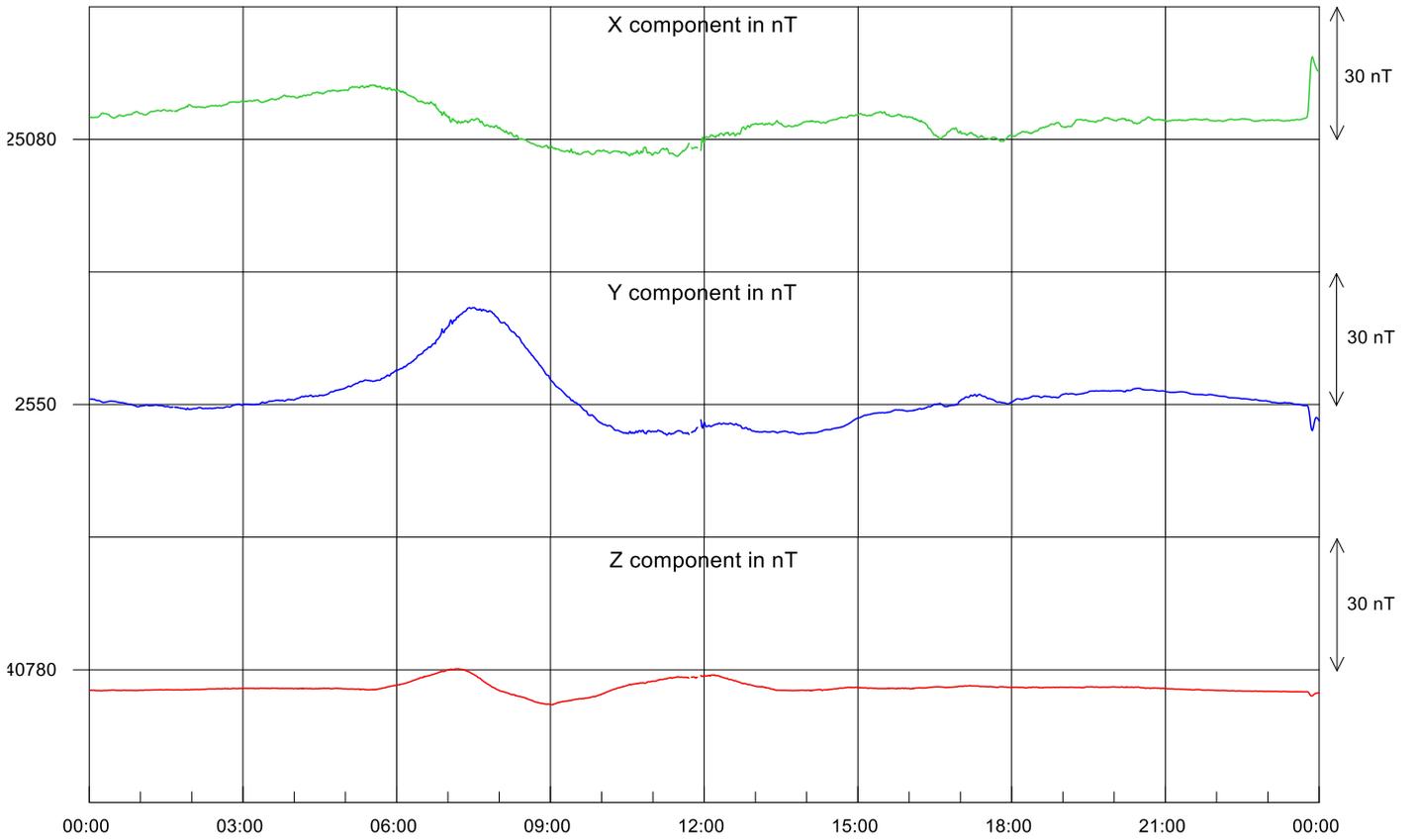
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Date: 28-12-2023

IZN Magnetic Observatory

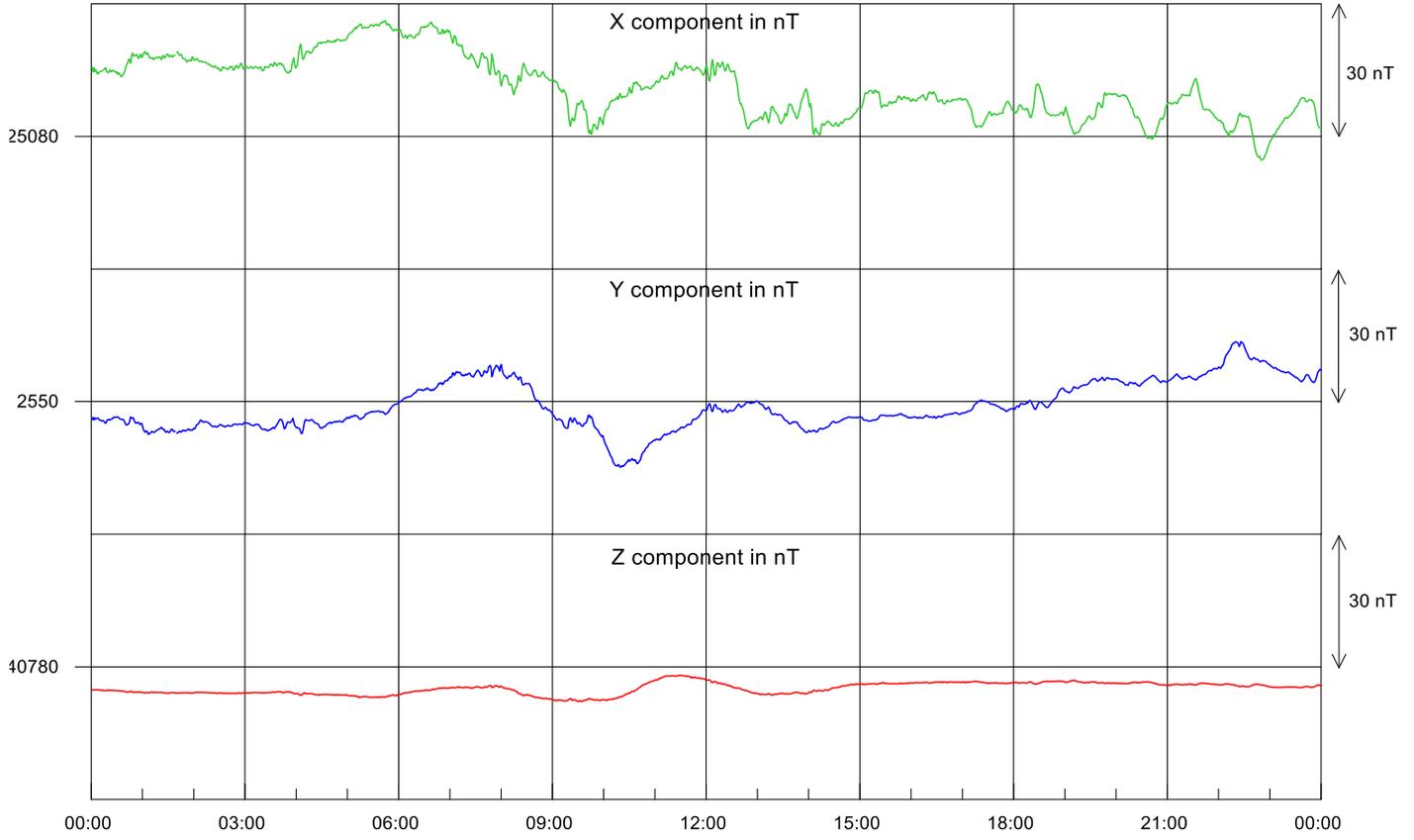
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Date: 29-12-2023

IZN Magnetic Observatory

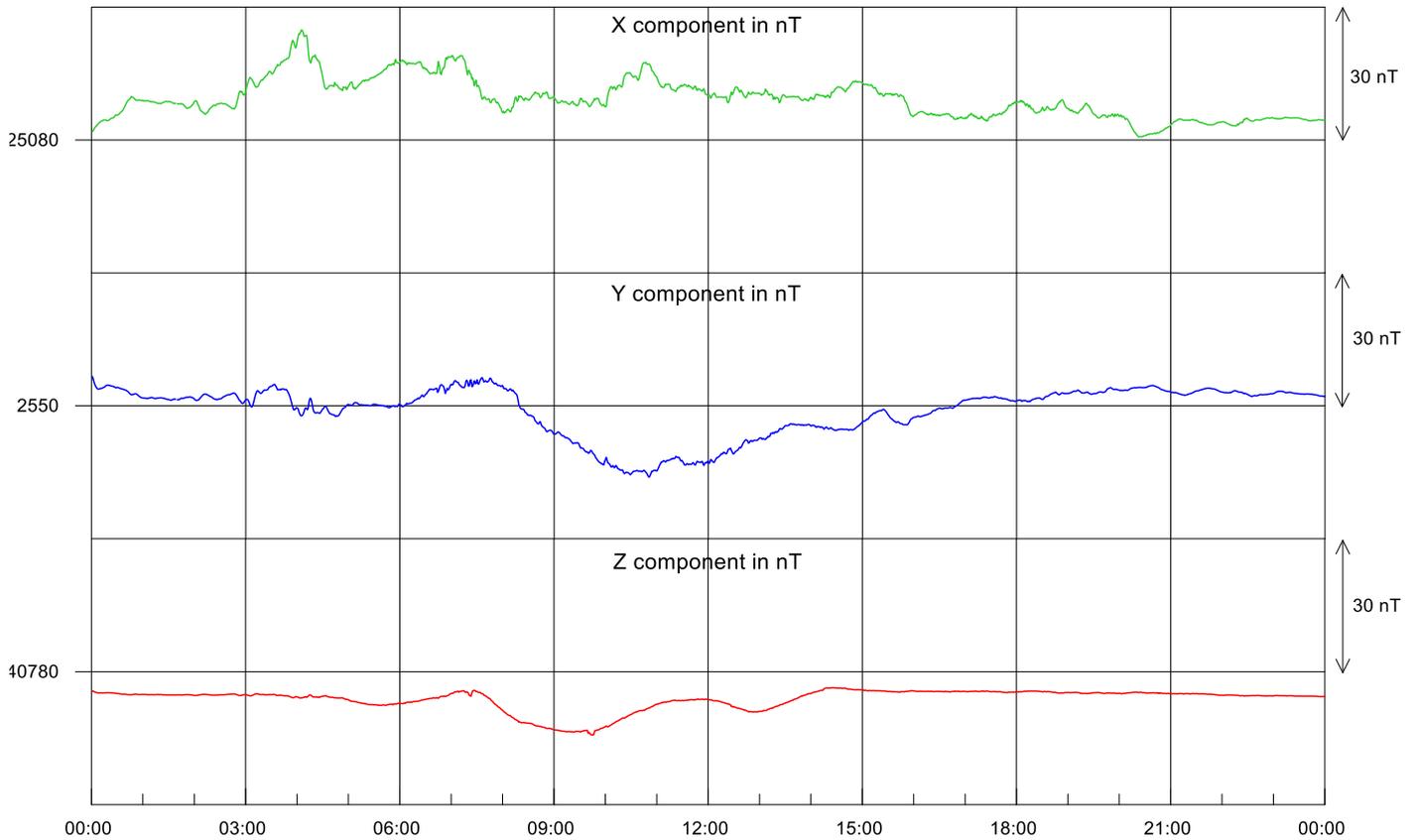
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Date: 30-12-2023

IZN Magnetic Observatory

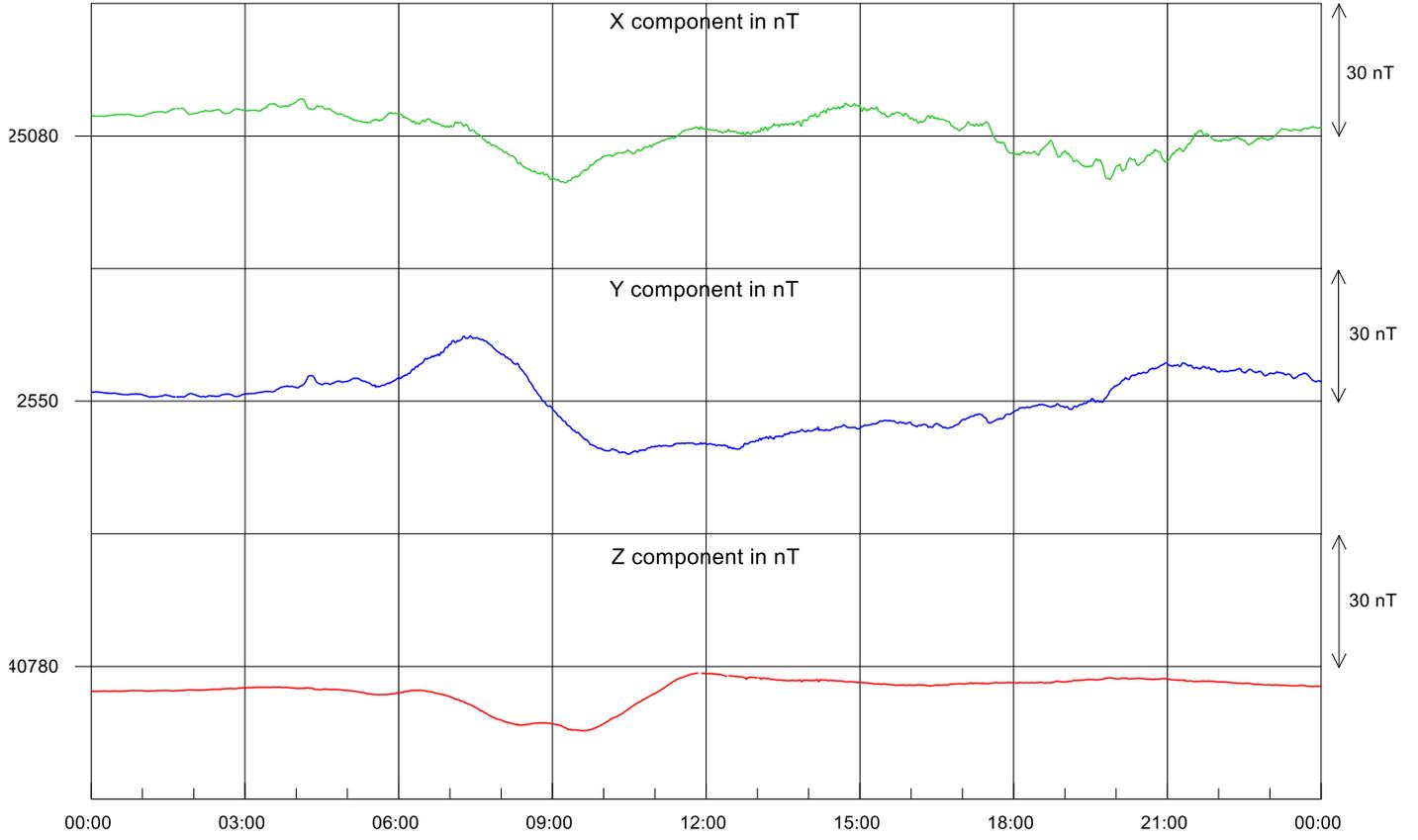
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Date: 31-12-2023

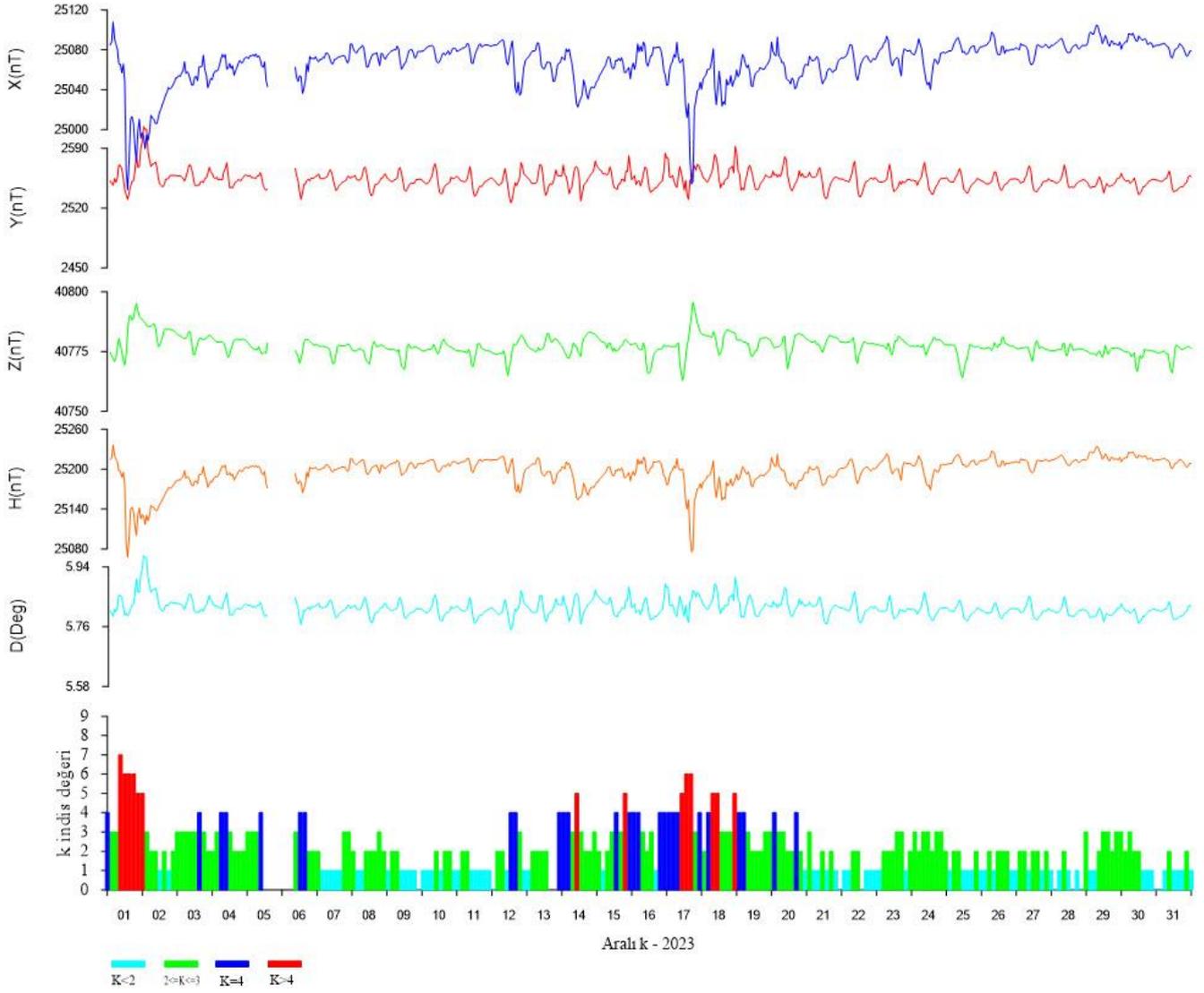
IZN Magnetic Observatory

Day number: 365



Şekil-1. İznik Manyetik Rasathanesi'nde kaydedilen 2023 Aralık ayı günlük manyetik alan değişimi.

Figure-1. Daily geomagnetic variation recorded at Iznik Geomagnetic Observatory in December, 2023.



Şekil-2. 2023 Aralık ayı yer manyetik alanın değişimi ve K aktivite değeri.

İzmit Manyetik Rasathanesi'nde 01 – 31 Aralık 2023 tarihlerinde kaydedilen yer manyetik alanın günlük değişimi sırasıyla **X**, **Y**, **Z**, **H** ve **D** bileşenlerinde saatlik ortalamalar halinde verilmiştir. En alttaki grafik İzmit Manyetik Rasathanesi verileri kullanılarak hesaplanan K aktivite değerini göstermektedir. 01, 02, 14, 15, 17 ve 18 Aralık tarihlerinde K aktivite değeri 4'ün üzerine çıkmıştır. 03, 04, 05, 06, 12, 13, 16, 19 ve 20 Aralık tarihlerinde ise K değeri 4 civarlarındadır. Diğer günlerde yermanyetik alanı daha sakin değişim göstermiştir.

Figure-2. Daily geomagnetic variation in December 2023, and K activity index.

The hourly mean variation of **X**, **Y**, **Z**, **H** and **D** components at Izmit Geomagnetic Observatory between 01 - 31 December, 2023 are given. The bottom chart shows the K activity index obtained from IZN data. As seen, its value is above 4 on the days 01, 02, 14, 15, 17 and 18, and around 4 on the days 03, 04, 05, 06, 12, 13, 16, 19 and 20 in December. The other days, geomagnetic field showed quiet variation.