

## **The Anomalous Magnetic Field of “Kaprovani” Settlement Territory and its Geological Interpretation**

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### **ABSTRACT**

*As a result of the geomagnetic studies conducted on the territory of Kaprovani we determined the magnetic absorption intensity of the anomalous magnetic field and the sand of the territory, percentage of ferromagnetic minerals in the sand and the source of the anomalous magnetic field.*

**Key words:** *magnetic field, magnetic anomaly, magnetic absorption.*

The Black Sea area of Georgia, its sand saturated with magnetic minerals, is of universal interest due to its effective healing value. Nevertheless, detailed geomagnetic surveys of the area have not been conducted until recently. In order to solve this problem, we carried out geomagnetic surveys in the area with modern digital equipment (proton magnetometer G-856, susceptimeter KM-7) and determined the composition of the magnetic minerals in the sand samples in a laboratory.

The magnetic field of the study area was planned for 30 profiles in meridian direction (parallel to the sea coast) in 1:1000 scale. The vertical gradient of the magnetic field was determined in several areas of the territory.

The anomalous magnetic field map of the studied area is shown in *Figure 1*.

As the map shows, the anomalous magnetic field of the territory is intense and inhomogeneous. According to the intensity of the anomalies, the territory can be divided into three zones.

The first zone covers the territory from the sea shore including Profiles 1, 2, 3, where the intensity of the anomaly is 400-500 nT.

The second zone includes Profiles 4 - 14, where the anomaly of the magnetic field varies within 250-400 nT.

The third zone is significantly different from the previous two zones, both in terms of magnetic field intensity and nature. Starting from Profile 15 to Profile 18, the magnetic field anomaly is negative.

In the eastern part of the territory (Profiles 20-30), the magnetic field is quite varied and changes within 250-550 nT.

The studies of the vertical gradient of the magnetic field at 0.5m, 1m, 1.5m and 2m heights show that the anomaly decreases rapidly with height.

As the laboratory studies of the sand samples taken in the area show the main ferromagnetic minerals in the sand are magnetite and titanomagnetite. Their total amount in the sand is 10%.

Number of profiles

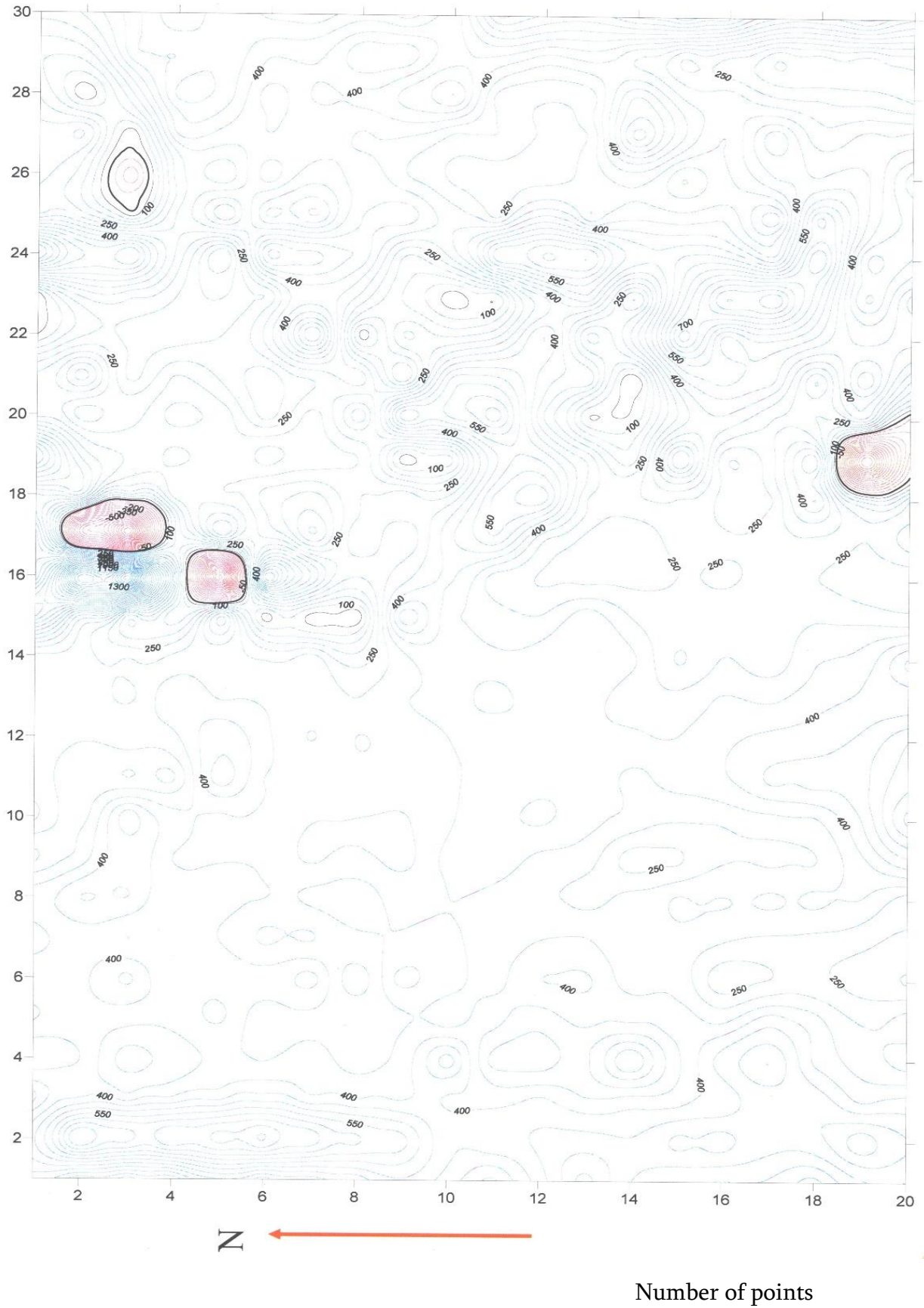


Fig. 1.

## Conclusion

The field investigations conducted on the territory of settlement “Kaprovani” showed that the anomalous magnetic field of the area is intense and changes within the range of 250-550 nT.

A rapid decrease in the vertical gradient of the magnetic field means that the source of the magnetic field is close to the diurnal surface. Besides, the laboratory analysis of the sand samples revealed that the value of ferromagnetic mineral composition in the sand is high. All above said confirms that the main source of the anomalous magnetic field in the investigated area is the sand spread over it, while strongly disturbed values of the magnetic field in some areas of the territory are caused by technogenic reasons.

## References

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## დასახლება „კაპროვანის“ ტერიტორიის ანომალური მაგნიტური ველი და მისი გეოლოგიური ინტერპრეტაცია

რ. გოგუა, ჯ. ქირია ნ. ლლონტი

### რეზიუმე

„კაპროვანის“ ტერიტორიაზე ჩატარებული გეომაგნიტური კვლევების შედეგად დადგენილია: ტერიტორიის ანომალური მაგნიტური ველის და ქვიშის მაგნიტური შემთვისებლობის ინტენსივობა, ქვიშის ფერომაგნიტური მინერალების პროცენტული რაოდენობა და ანომალური მაგნიტური ველის წყარო.

**საკვანძო სიტყვები:** მაგნიტური ველი, მაგნიტური ანომალია, მაგნიტური შთანთქმა.

## Аномальное магнитное поле района поселка «Капровани» и его геологическая интерпретация

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### Резюме

В результате геомагнитных исследований, проведенных на территории «Капровани», установлены: напряженность аномального магнитного поля и магнитное свойство песка, процентное содержание ферромагнитных минералов в песке и источник аномального магнитного поля.

**Ключевые слова:** магнитное поле, магнитная аномалия, магнитное поглощение.