

MAGNETIC FIELD DETECTION



Deviations of a magnetic field model from measured data, data created by satellites with sensitive magnetometers

The Earth's magnetic field strength was measured by Carl Friedrich Gauss in 1835 and has been repeatedly measured since then, showing a relative decay of about 10% over the last 150 years. [17] The Magsat satellite and later satellites have used 3-axis vector magnetometers to probe the 3-D structure of the Earth's magnetic field. The later Ørsted satellite allowed a comparison indicating a dynamic geodynamo in action that appears to be giving rise to an alternate pole under the Atlantic Ocean west of S. Africa.[18]

Governments sometimes operate units that specialise in measurement of the Earth's magnetic field. These are geomagnetic observatories, typically part of a national Geological Survey.

Such observatories can measure and forecast magnetic conditions that sometimes affect communications, electric power, and other human activities. (See magnetic storm.)

The International Real-time Magnetic Observatory Network, with over 100 interlinked geomagnetic observatories around the world has been recording the earth's magnetic field since 1991.

The military determines local geomagnetic field characteristics, in order to detect anomalies in the natural background that might be caused by a significant metallic object such as a submerged submarine. Typically, these magnetic anomaly detectors are flown in aircraft like the UK's Nimrod or towed as an instrument or an array of instruments from surface ships.

Commercially, geophysical prospecting companies also use magnetic detectors to identify naturally occurring anomalies from ore bodies, such as the Kursk Magnetic Anomaly.

Animals including birds and turtles can detect the Earth's magnetic field, and use the field to navigate during migration.[19] Cows and wild deer tend to align their bodies north-south while relaxing, but not when the animals are under high voltage power lines, leading researchers to believe magnetism is responsible.

Source: http://web.ua.es/docivis/magnet/earths_magnetic_field2.html