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Case Study

Scientific Reality of The Leh-Magnetic Hill/ Gravity Hill

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Abstract

The paper consists of parameters from investigation conducted at Magnetic Hill near Leh region of Himalayas. It has been observed that the magnitude of magnetic intensity in this part of Himalayas remains high however within the limits of magnitude of earth's surface magnetic field range. The Z component of the earth's magnetic field intensity is vertically upward and hence negative. Hence the observed phenomenon has been tried to explain with the known physical phenomenon's and is not gravity defying.

Introduction

The "magnetic hill" is located on the Leh-Kargil-Baltik national highway, about 30 km from Leh, at a height of 14,000 feet above sea level.The Indian Army maintains a Sikh Gurudwara near the hill where Guru Nanak Dev, the first of the Ten Gurus of Sikhism, meditated in the 15th century. Due to both the Gurudwara and the gravity hill, the area has become a popular sightseeing destination.

It is mentioned that the hill is gravity defying and it is believed that the magnetic force ensures an automobile is carried up the hill via a magnetic force of attraction generated by nearby mountains. Hence, the investigation using magnetometer was conducted at various different sites along the magnetic hill.

For all the graphs,the x refers to the magnetic flux parallel to the ground or northward direction, y refers to the eastward magnetic flux and z refers to the magnetic flux in vertically upward direction (since the magnitude is –ve), MF or series 4 refers to the magnetic intensity.

The earth's magnetic intensity varies from place to place depending upon the magnetic properties of soil/rock, if the place is at high altitude then radiation levels are to be taken into consideration, the sequences of phenomena that give rise to geomagnetic disturbances originate on the Sun. The simplest starts with the electromagnetic radiation given off by the Sun. As well as illuminating and heating the day-side of the earth, this radiation also heats the ionosphere causing convection. The convection moves charged particles through the earth's magnetic field creating a dynamo action that drives ionospheric electric currents above the equator and up to mid latitudes. These currents produce a magnetic field that, viewed from space, appears fixed on the day side of the earth [1] [2].

Case 1:- the magnetic field variations were measured at the magnetic road, the x refers to the magnetic flux parallel to the ground, y refers to the eastward magnetic flux and z refers to the magnetic flux in vertically upward direction (since the magnitude is –ve).

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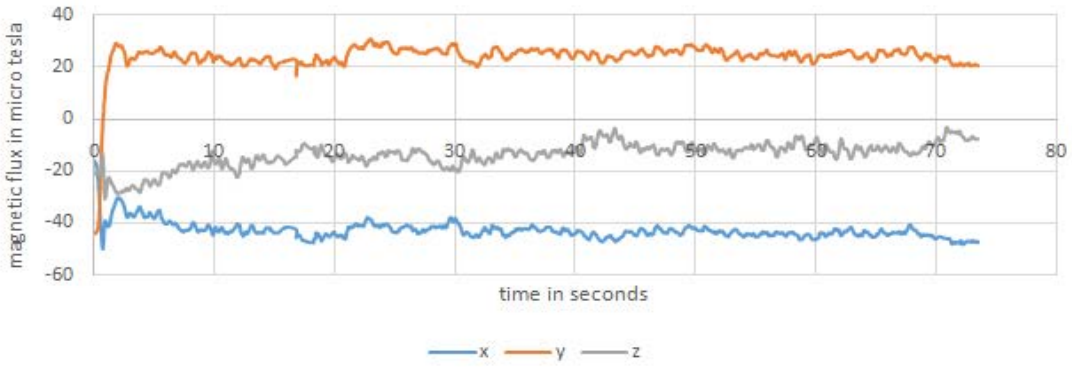
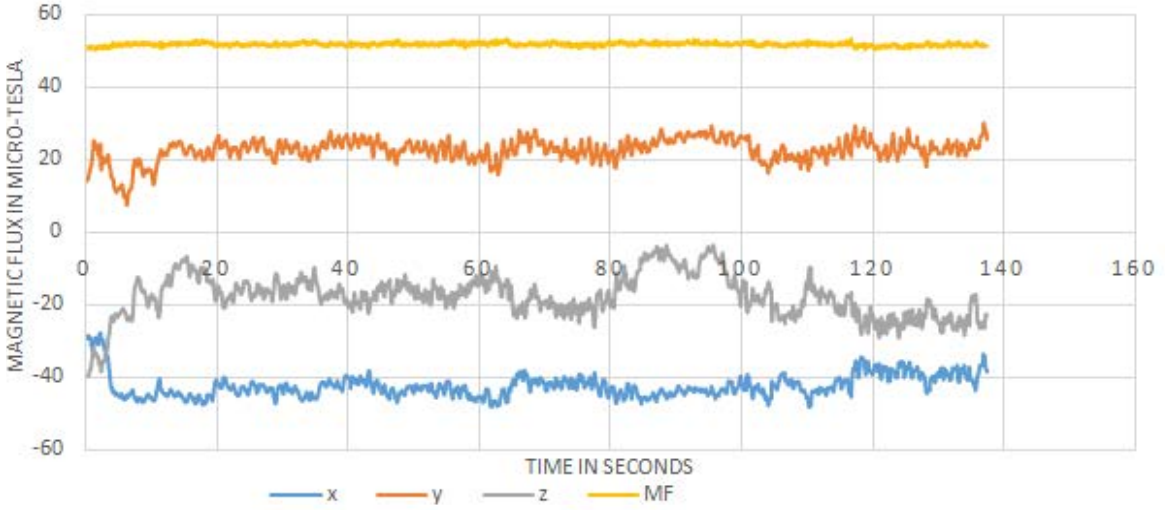
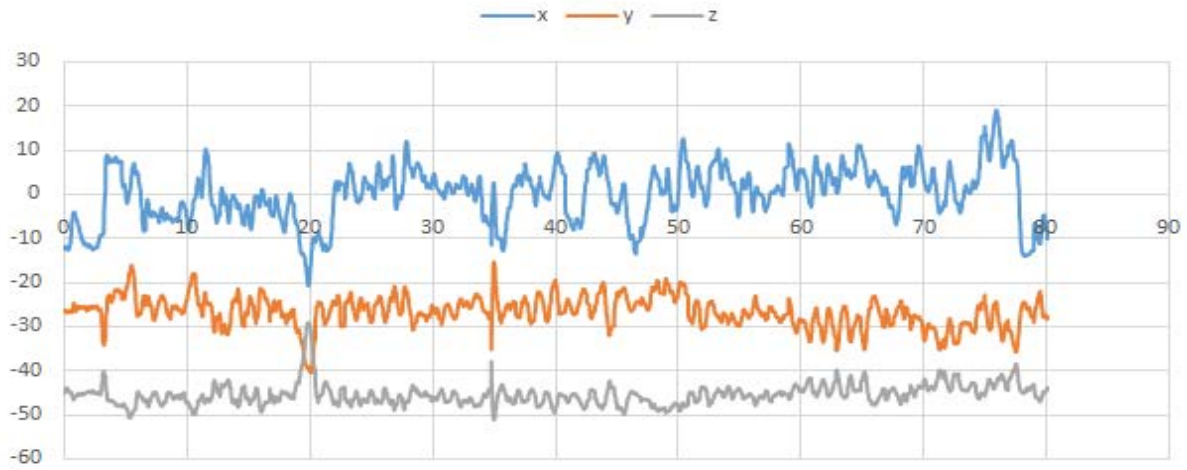


The magnetic flux variation at the Magnetic hill road itself. The average magnetic intensity is approximately 51µT which is well within the limits of earth's surface magnetic intensity. Also the magnetic field is not strong enough to cause any displacement due its presence.

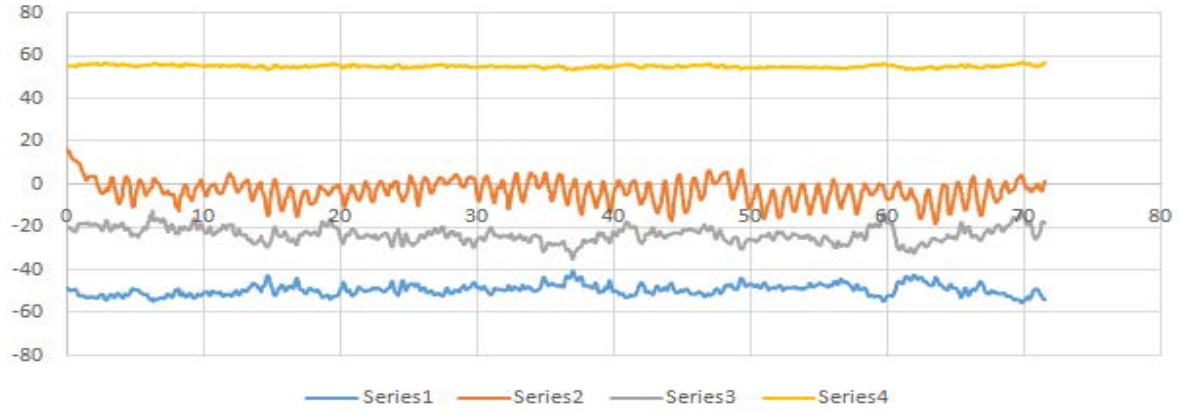
Case 2:- The below readings were recorded while circling the so called ''magnetic hill'' which is supposedly known to cause the ''magnetic hill effect'', the average magnetic intensity is approximately 51.7µT which is also well within the limits of the earth's surface magnetic field range. Also experiments with magnetic compass were conducted where the needle did not show any abnormal fluctuation.



Case 3:- The below readings were recorded while circling the so called ''magnetic hill'' which is supposedly known to cause the ''magnetic hill effect'', the average magnetic intensity is approximately 51.4µT.



Case 4:- The below readings are taken while at the top of magnetic hill. The average magnetic intensity is highest at this point with an average magnitude of about 55µT with peaks of 58µT however it is under the range of earth's surface magnetic field range. But the magnitude is higher relative to other isolated places.



From all the above cases we can conclude that the magnetic field is within the earth's surface magnetic field range and hence magnetic field is no way responsible for the pulling effect. However, it is to be understood that the earth's magnetic field varies from place to place and depends on properties of soil/rock present at the same.

Our observed that the magnetic field vectors in X, Y, Z directions fluctuate much more rapidly in and around Leh part of Himalayas when compared to low altitude places like Jaipur. The rapid fluctuations can be attributed to the high radiation levels refer to fig 2 measured in sunlight and fig 3 in shadow.

1. Much before Leh **2.At the hill facing sun** **3.Opposite side of hill (shadow)**

The team also conducted experiments using iron filings, natural-strong- magnet for any observation which would help explain the pulling of automobiles up the hill, but nothing appreciable enough was felt or observed.

They also conducted experiment by rolling down the bike, the bike reached a terminal speed of about 22km/hr at one side and 17km/hr while reverse. However it is attributed to the –ve gradient in the tarmac not any type of magnetic interference.

Conclusions

The magnetic hill is a hoax, there is unusual about the hill apart from the gradient which causes the automobiles to roll. The radiation levels at upper Himalayas are very high, in fact in some places the levels are recorded highest in the world hence the magnetic flux variations can be attributed to the radiation interferences. The magnetic intensity is not significant to cause any force i.e., either push or pull on anything however big or small.

However the effects some people report about the magnetic effects in all likelihood is due to the psychological effects coupled with high altitude environment which gives the sensation.

References

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