GEOMAGNETIC STUDY OF CARANCAS METEORITE AND ITS CRATER. D. Rosales[1], E. Vidal[1] , J. Ishitsuka[2], S. Benavente[3] [1]Observatorio Geomagnético de Huancayo - Huancayo 46, Perú [2]Instituto Geofisico del Perú – Badajoz 169 Ate, Lima, Perú [3]Universidad Nacional del Altiplano, Puno, Perú.

Introduction: On September, 15th, 2007, 16:45 hours UT, the impact of a meteorite took place in the Carancas community, Desaguadero town, Chucuito city, region of Puno, Peru, located near the frontier with Bolivia. The geodesic coordinates of the center of the crater measured with GPS are: Latitude 16°39' 52.2" South, Longitude 69°02' 38.8" West, Altitude 3,824 m above sea level. Formed impact Crater is approximately 13.5 m in diameter (Fig. 1).

Fig. 1 - Photo of the crater October, 31 st, 2007

In the moment of the crater formation a strong explosion took place, wasn't registered people victims, only a bull that was near the crater formation site, was thrown by the shock wave and losing a horn because the bull fall into the floor.

Fragments of the meteorite were picked up and sent to laboratories for Petrographic analysis; results correspond to a meteorite type **Ordinary Chondrite** and for their iron content it corresponds to the group **H 4-5** [3].

Geological characteristic of the impact area:

Fig. 2. Photo of water inside the crater.

The crater product of the impact of meteorite was formed between cultivation land and a river bank, part of crater is on the edge of the channel of Carancas river, which usually carries water in rainy season, and due to the proximity of the Titicaca lake, water vein layer is at less than 2 m of depth, that's why the bottom of the crater shows water (Fig. 2).

Magnetization of the Meteorite: We used a proton magnetometer to observed magnetic properties (Breiner [1]) of a meteorite fragment; sample was 28.277 gr, 2.460 cm of mean diameter, and 3.629 gr/cm^3 of density. We observed that the fragment contains remanent magnetization per volume unit of $I_r = 0.2054$ Gauss (Table 1).

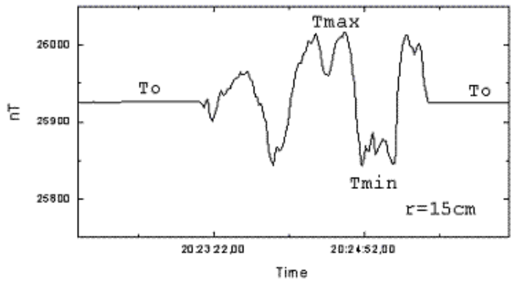

Fig. 3 - Remanent magnetization at 15cm of a fragment of meteorite .

r (cm)	T_{robs} (nT)	$T_{r\,mod}$ (nT)
10	282.88	320.20
15	93.13	94.88
20	39.71	40.03
25	20.25	20.49
30	11.49	11.86
40	4.79	5.00
50	2.67	2.56
60	-	1.48
70	-	0.93
75	0.80	0.76
80	-	0.63
90	-	0.44
100	-	0.32

Table 1. Anomaly observed T_{robs}, anomaly amplitude modeled $T_{r\,mod}$ for the analyzed fragment.

Geomagnetic Survey: In order to study the structure of the crater and to determine the presence of some considerable size fragment of meteorite inside the crater, and for its extraction, we performed a geomagnetic survey (Irving [2]); considering magnetic properties of the meteorite we tried to determine position and depth of some possible fragment of meteorite.

The geomagnetic measurements were performed in two phases; first one was done from 28 th to 30 th of September 2007, and the second from 28th to 31st of October 2007. Surveyed areas are shown in Fig. 6.

Construction of map of geomagnetic anomalies: We used two protons precession magnetometers, some magnetic anomalies were observed around the crater, for the most remarkable anomalies amplitude is within -11 and +17nT, inside the crater important anomalies were not found. Using parameter of magnetization of the analyzed sample, we estimated the depth to which could be some meteorite fragments.

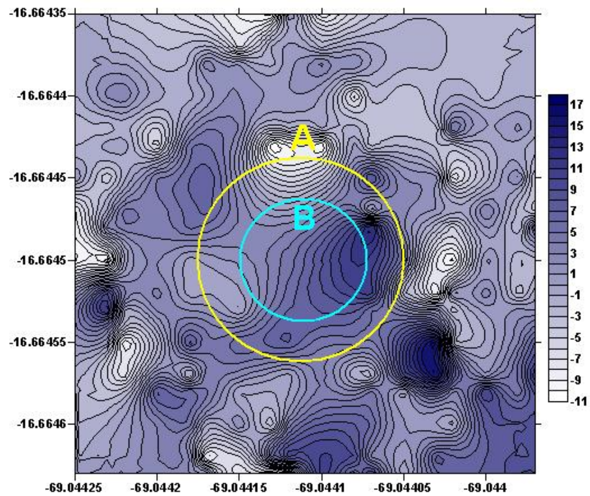

Fig. 5. Map of geomagnetic anomalies of the crater, the circle A is the crater rim and B is the water pond.

Distribution of Ejected Material: The maximum distance of ejected material varies among 128 meters in the NE direction "point 1" and 248 meters in the SW direction "point 5"(Table 2).

The circles blue and red they are two possible ejected material areas(Fig. 6).

Point	Latitude (Degrees)	Longitude (Degrees)	Distance of the crater
0	-16.664500	-69.044111	0
1	-16.663333	-69.043889	128
2	-16.663611	-69.045000	136
3	-16.664722	-69.045833	188
4	-16.666389	-69.045833	276
5	-16.667500	-69.045278	348
6	-16.667222	-69.043056	315
7	-16.665278	-69.042222	221
8	-16.663889	-69.041944	243

Table 2. Distribution of ejected material.

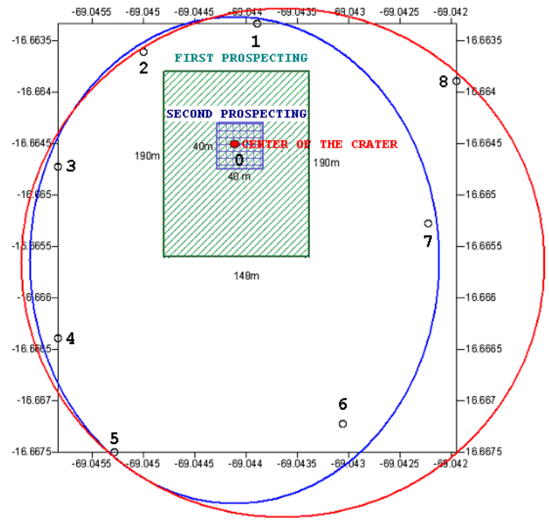

Fig. 6. Plot of maximum distribution of ejected material.

Fig. 7. Photo of ejected material.

Reference: [1] S. Breiner, Applications Manual for Portable Magnetometers, Geometrics, San Jose, California, 1999. [2] E. Irving, Paleomagnetism and its Application to Geological and Geophysical Problems, John Wiley & Sons, inc., New York, London, Sidney, 1964.[3] E. Varela CASLEO, F. Brandztatter NATURHISTORISCHES MUSEMUM, Estudio petrografico Argentina, Austria 2007.