perfiles

...YOUR GEOPHYSICAL NEWSLETTER

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Induced polarization-resistivity–spontaneous potential–magnetometry–gravity-electromagnetics-seismics–well-logging
MINING – GROUNDWATER – ENGINEERING - ARCHAEOLOGY

CHEERS!

Our company started the current year with a large amount of porjects and we've had an even greater increase of geophysical demand in mining exploration and engineering applications over the last three months. This was the reason that we were not able to participate in most of ProExplo 2007's presentations, as we had several reports to complete in those days.

Our Central American activities have also increased, which is why we are currently expanding our crew capabilities and our geophysical services and applications over the next few months.

We appreciate the continued support we get for *Perfiles* and its increasing number of readers among the geoscience community.

José R. Arce

INSTRUMENTS AND ACCESORIES

As we announced on our previous edition of *Perfiles*, we are currently waiting for the delivery of our new state-of-the-art gravity meter Scintrex CG5, which will allow us to offer micro-gravity surveys with the most advanced technology available in gravity meters. We look forward to present some interesting gravity applications in a future edition of *Perfiles*, and using our CG5.

We have also expanded our seismic capabilities with new cables and geophones recently acquired from Geospace Technologies from Houston, and with different specifications. These new accessories will operate with both our Geometrics Strataview R24 and Stratavisor NZXP seismograph crews.

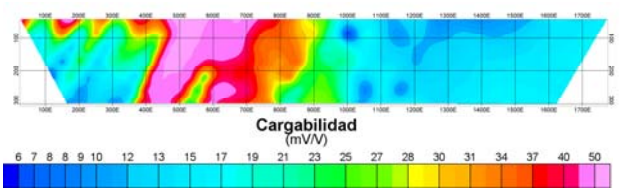
INDUCED POLARIZATION: 2D vs 3D

We have commented, in previous editions of *Perfiles*, how our experience with 3D Induced Polarization started in 2002. After five years of continuously applying this technique, we clearly understand its advantages and limitations, with very few of the latest.

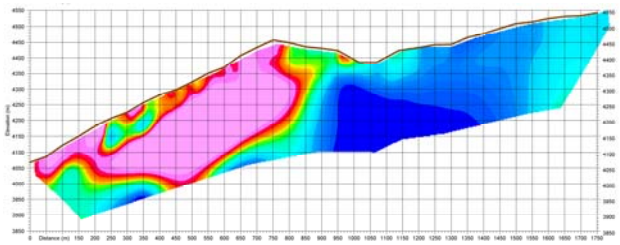
The Pole-Pole and Pole-Dipole electrode arrays energize a very large terrain volume in order to be able to take measurements at discrete distances along specific profiles, which may cause in 2D modeling the detection of anomalies whose sources are actually located between lines. That is why if 3D IP modeling is applied correctly, with an appropriate line separation and station density, the results are significantly more reliable and precise.

In modern 3D IP surveys, line separation may vary between 50 and a maximum of 200 meters, to obtain appropriate information for 3D modeling and later correlation, and depending on the mineralization target size. For veins and small mineralization bodies, we usually employ 50 or 100m line spacing, while for large deposits and porphyry systems we consider 200 meters to be sufficient.

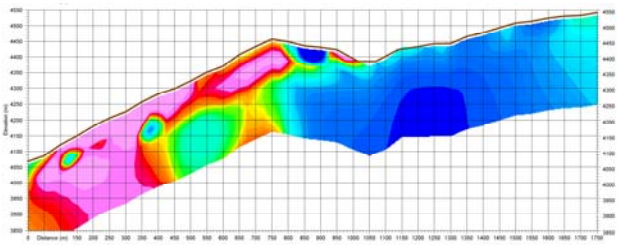
The first image we show below is a chargeability pseudo-section (please note pseudo = false) for an IP survey line acquired in Central Perú and in a polymetallic (Pb-Zn-Cu-Ag) mineralization project. This line is part of a survey consisting of 35 parallel lines separated by an average of 100 meters. Topography was also very difficult. The pseudo-section shows the presence of a large apparent chargeability anomaly with over 40 mV/V of intensity.



The next image shows the 2D model for the line. This was used as a daily control and presentation of results. An extensive and intense true chargeability anomaly can be clearly distinguished and with very sharp boundaries.



Three-dimensional modeling of the induced polarization information produces an (X,Y,Z,M) isometric block with a high number of cells, as a final result. One of our post-processing applications allows us to extract sections, plan views (either depth or elevation) and cuts in any direction which we require. With this tool we reproduce the original profile locations but with 3D results, as we show next.



If we compare the 2D and 3D models for the above line, we will notice very dramatic differences. In this particular case, we expect influence from mineralization occurring in-between lines and in medium-size bodies, which may not be defined with a standard 2D modeling technique, but that three-dimensional induced polarization can accurately define.

Until next time.....

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