# O9-8 COMPUTER INTERPRETATION OF VES CURVES

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As in all applied geophysical methods, the purpose of DC resistivity method is to determine the earth structure to a certain depth. Vertical Electrical Sounding (VES) is used to determine the resistivities and thickness of layers that are horizontal or close to horizontal. As it is known, at the end of resistivity studies, apparent resistivity values, which show the change of resistivities with depth, are calculated and plotted. From such a resistivity curve, there are a few ways of obtaining parameters of layers, pertaining thickness and resistivities .

The first approach in obtaining the parameters is the method of curve matching. A much more accurate and dependable method of interpretation in electric drilling involves the comparison of field profiles with characteristic curve. The model of which the field apparent resistivity curve has already been drawn is tried to match with curves. If there is a fitting, field curve layer parameters are accepted to give parameters of the model obtained by matching.

In interpreting the VES curves by curve matching method; due to the personal error, that is, choosing the wrong model curves during matching, results in choosing the wrong parameters. In other words, the amount of error increasing or decreasing during the interpretation depends on the knowledge or capacity of the person doing the interpretation.

With the application of linear filtering techniques (Ghosh 1971) becoming widespread, numerical calculation of apparent resistivity curves has brought a new dimension to the modeling studies. With the development of computer technology, this assessment work is not done with model curves any more but it is done numerically by computers much better and efficiently. With this aim, wibdows'98 based "SENREZ" program vas devised for the interpretation of VES curves.

A number of features provided by windows'98 was included in this program. For example, inclusion of menu bar and shortcut icons, and separately the inclusion of worksheet feature for enter of data increases the usability of this program.

Two basic of features provided in the software program. The first one is that it provides opportunity to work on the map base. That is, making use of all the VES curves obtained from field of work, level map can be prepared for desired depth by sampling with equal intervals. If desired, profiles can be taken from any place wanted to see the anomalies in horizontal direction. There is no need to enter new coordinates to get a profile. To do this, the mouse usage is enough to determine the beginning and the ending points of profile. At the other level of working at the map base, there exists opportunity for the preparation of the depth sounding resistivity contour maps of apparent resistivity.

Another basic feature is to conduct studies at the profile base. With this program it is possible to do assessment for three types of arrays. These are Schlumberger, Wenner, and dipol-dipol methods respectively. Also, these types of arrays can be transformed into each other (Basokur 1983).

As it is known, there appear some errors while changing the pot places during measurements. At the interpretation phase, to eliminate the errors arising from the said differences of pots places, this program includes curve shifting part. In addition to this part, the program also includes two more functions such as producing data for theoretical models and interpretation of the data obtained. Besides of these, rounding up of the data extending the data towards right or left, and bad point correction etc., can be carried out with this program.

The program includes two types of assessment methods: Forward and inverse solution methods. During the usage, model parameters, curves and possible underground geological model can be viewed on the screen simultaneously, and this feature increases the efficiently of the program. Within the framework of this poster, a few samples of application of “SENREZ” towards the interpretation of VES curves were presented.

## References

Basokur, A.T.,1983, Transformation of resistivity sounding measurement obtained in one electrode configuration to another configuration by means of digital linear filtering, Geophysics Prospecting,31,649-663

Ghosh,D.P.,1971a The application of linear filter theory to the direct interpretation of geoelectrical sounding measurements, Geoph. Pros.19,192-217.