



GeoElectro

User's Manual

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GeoElectrical Data Processor and Interpreter:

GeoElectro[®]

Version 5.00

R&D:

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What is VES2005

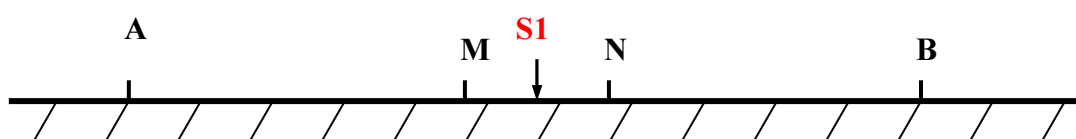
VES2005 is a windows based visual software to mutual process and interpret theoretical and field data of vertical sounding (VES) of Schlumberger or tri-pole configuration. The latest version can perform:

- ✘ Data transfer from the apparatus of CGIF to PC with RS232 cable
- ✘ Data editing: error data smoothing, non-flat terrain effect correction.
- ✘ Standard sounding plots output (log-log curve of 6.25cm module).
- ✘ 1D layered model inversion (including SVD method, Occam's method).
- ✘ Automatic 2D model inversion.
- ✘ pseudo-section drawing in linear or logarithmic format in z or AB/2 direction.

Nomenclatures

1. Station

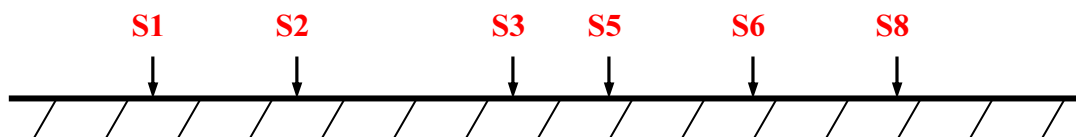
A Station is a position at which a (set of) data will be measured. For VES station, a station is a center point of the configuration. Station number is a label representing the station, for example **S1** in the following figure. Some time, Station is called Record Point.



2. Profile

A profile is a line along which there are several stations. In some case, only one station stays on a profile. Generally, a profile is a straight line. But some time, it may be a curve.

And stations on the profile may be distributed evenly, or spaced in an un-uniform manner.



3. KEY

Our software contains several modules, such as VES, in-loop TEM, MT. And each of these functions has a 5-digit serial number. This 5-digit number is called KEY. And to use a purchased module, user should release the restriction of the module by our supplied KEY. Only when it is correctly input for a certain module, will the restriction of the module be released. KEY should be registered when it is the first time to run the program. KEY can be got from the agent.

4. Dangle

Dangle is a USB hardware. The driver software of the USB dangle must be driven at the beginning of running our application software. And dangle must be installed during the running of VES processor and interpreter.

System Install

System requirement

Operation system:	Windows2000, Me, XP
Memory:	>64M
CPU:	Intel Pentium processor

Program suite.

1. Dangle (USB version)
2. Setup Disk
3. Authorized KEY for VES

Install steps

To run VES2005 properly, an authorized dangle is necessary. And there are two steps before running VES2005.

1. Program setup;
2. Dangle (USB) installing.

1. Setup program

- ❶ Insert setup disk into CD-Rom;
- ❷ Find directory named \\VES2005 in the disk;
- ❸ Enter the subdirectory and run setup program by double click “Setup.exe”;
- ❹ Follow the directions of the setup wizard to the end of setup.

After setup, an icon of VES2005 will appear at the desktop of your computer. Just double click it will launch VES2005 program.

Or you can run VES2005 in Startup menu like this: “Startup” ▶ “Program Files” ▶ “GeoElectro System” ▶ “VES processor and Interpreter”

2. Dangle Install

2.1 Run USB Installer

When it's the first time to insert USB dangle into your computer port, operation system will prompt “New USB device connect, please insert driver disk...”. Omit these warning and FOLLOW following direction.

Insert application software CD disk, find the subdirectory named “..\USB Installer”, run program “MicroDogInstDrv.exe”, and following program interface appears:



In the above interface, check the checkbox labeled by “1” and “2”, then click the button labeled by “3”. Wait for a moment, the driver program will be installed. At last, click the button labeled by “4” to finish the USB device driver software.

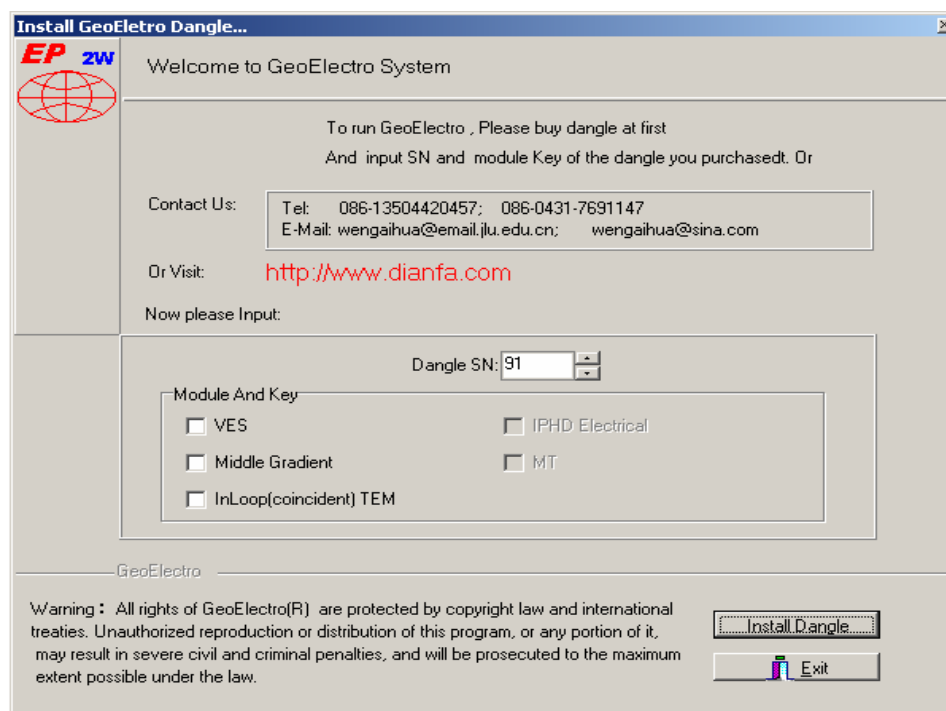
2.2 Insert Dangle into USB port

If the device driver was driven correctly, the dangle would be recognized by computer. And USB device icon will appear at the right bottom of windows. Otherwise, repeat the step described in the section “2.1”.

2.3 Register Software

To release the constrain of purchased module, run “Program register and installer” in the Startup menu this way:

▶ “Startup” ▶ “Program Files” ▶ “GeoElectro System” ▶ “Program register and Installer”. The installer interface appears as:



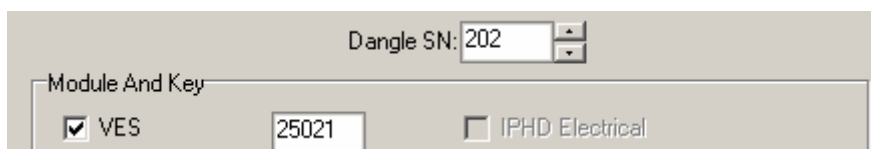
Our system is a multi-module program. And the dangle is shared by all the possible modules. Presently, three modules can be purchased and installed:

- ❶ Geoelectrical vertical sounding method for Schlumberger of Tri-pole configuration (VES)
- ❷ Middle gradient method or rectangle method(Middle gradient)
- ❸ In-loop or coincident loop transient electromagnetic method(Inloop TEM)

For each dangle and each module, we supply unique key to register your program. Please ask agent for module KEY when purchasing module.

To register a module, following directions below:

- ▶ Enter dangle serial number at “Dangle SN” box. Dangle SN can be found at the back of each dangle. For example, like “GE 202”, SN is 202.
- ▶ Check the module you purchased, and replace the key number of the module with the KEY supplied by agent.



- ▶ Click “Install Dangle” to complete the install.

2.4 FAQs:

1 SN error: If the SN is not compatible with that of dangle back, an error happens,



2 KEY error: If module Key error, following below directions.



Generally, the above error may be due to the failure of device driver program not installed. A best way to tackle the problem is repeat the steps in section “2.1” and “2.3”.

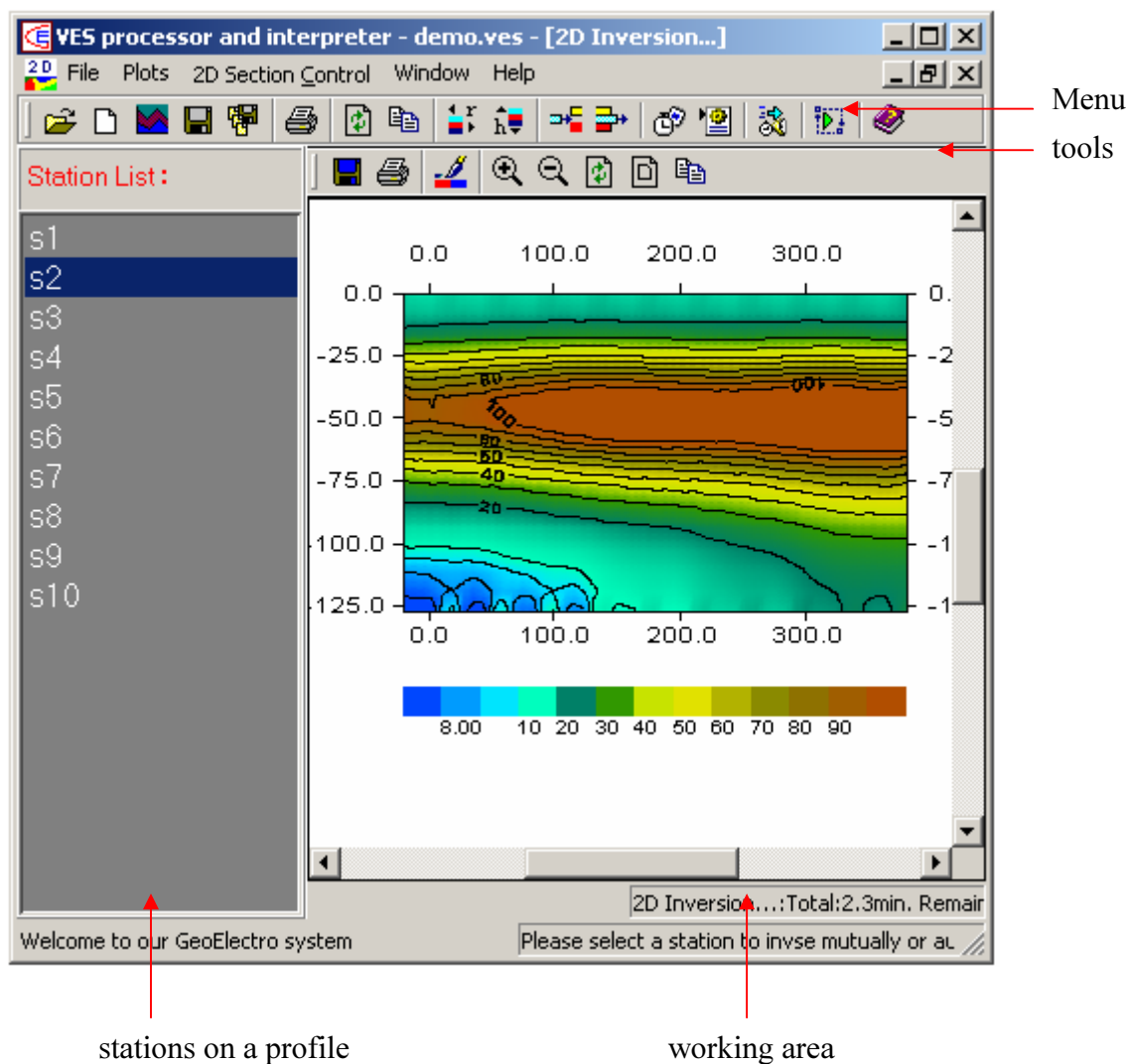
2.5 ATTENTIONs

1 To run the VES2005 correctly, you must drive the dangle and register the purchased module at the first time. And once the dangle installed, VES2005 can be run at any time.


2 During the program running, the dangle should be connected on your computer, otherwise, the program will run in wrong state, and sometime cause data lost of your dangle.

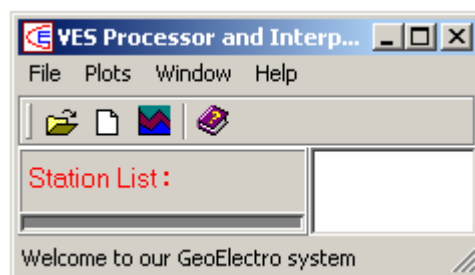
VES2005


1. VES2005 User Interface

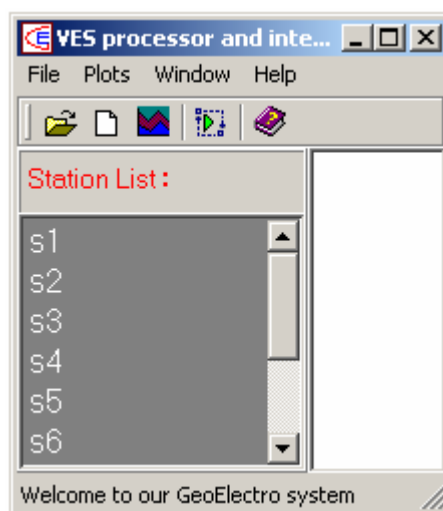



2. Startup

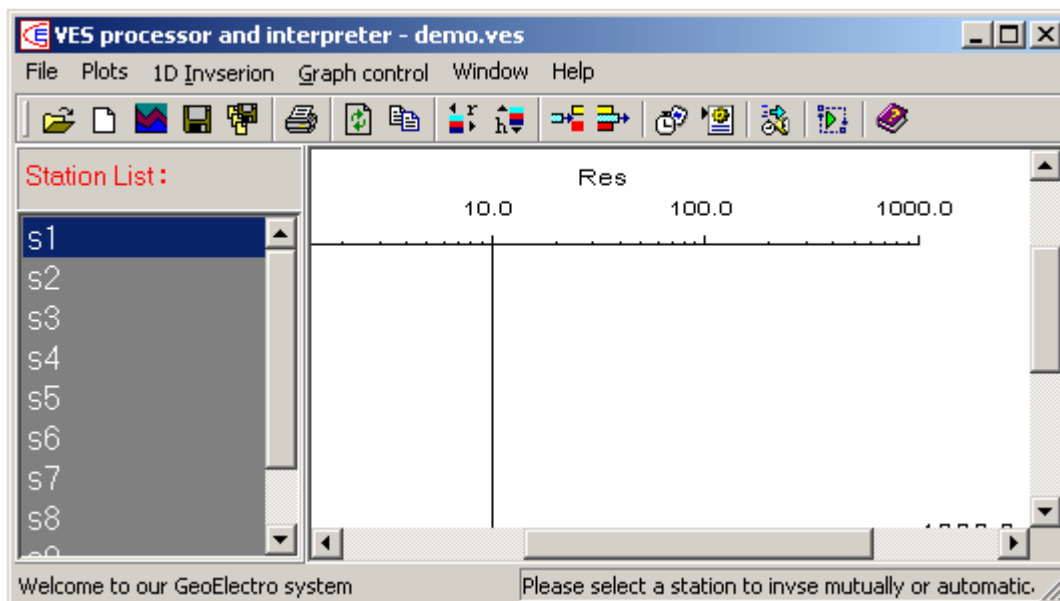
2.1 Launch VES2005 (click the shortcut icon  at the desktop. The interface is like).




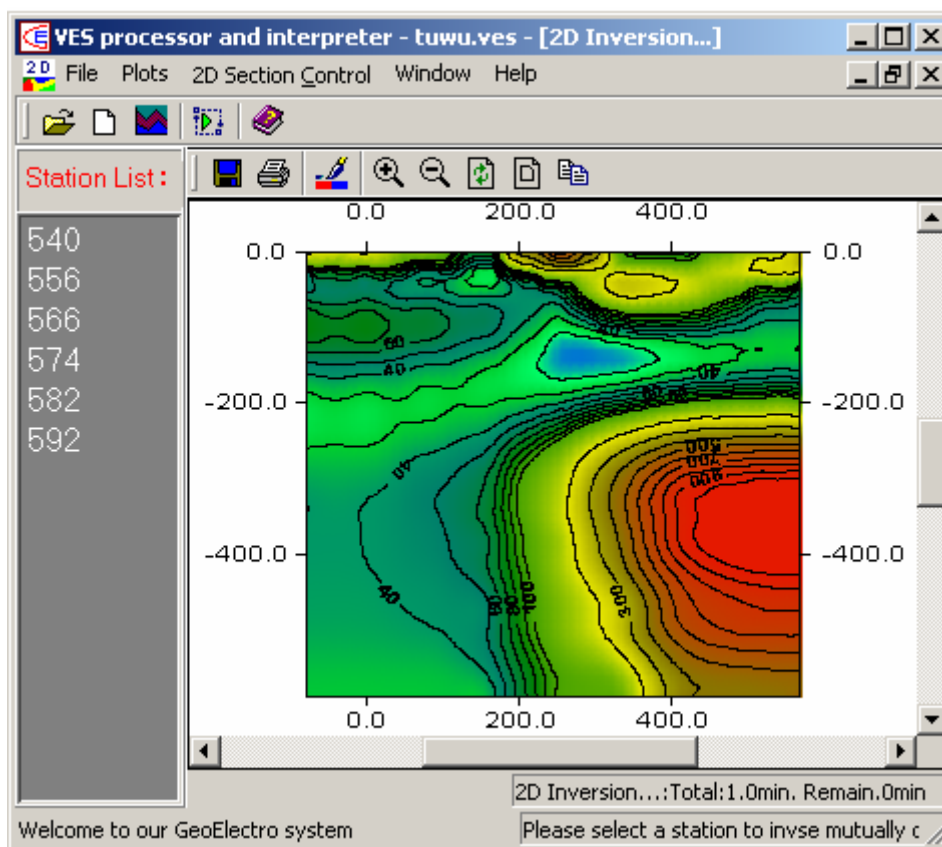
2.2 Click  on the toolbar of VES2005 interface and select a desired VES file, and open the file. Now the interface appears as the following. Notice that the stations in the opened profile appear at the left panel of the program.



2.3 Click any station, for example, "S1", in Station List. A child window will appear for user to inverse 1D model for "S1" station, and toolbar changes; click  to inverse 1D model automatically.




2.4. Click  to inverse profile in 2D model mode automatically. After each iteration, the inversed model will be shown in color map in a child window. Generally, 3 time iteration will be used to generate final model.



3. Tools in 2D inversion with VES2005

To inverse a 2D inversion of a profile, user can simply open a file and execute 2D inversion function. Currently, a profile of at most 63 stations can be inverted with VES2005. However, to inverse with 2D mode, there are at least 3 stations on a profile.




Inversion convergence can be reached after 4 to 5 iterations.


To execute 2D inversion, just click  after a proper VES file opened. The 2D model section of present profile will be drawn in a child window. And at the same time, a DOS mode program called VES2DW will run. And the inversion results of each iteration will be updated in the child window simultaneously.

Once 2D inversion startup, the inversion state will appear in the status bar at the bottom of window so that user can know what the inversion process is.


When inversion completes, **VES2DW** will close automatically. And user can process the inversion result like copy, print, save and etc.


Functions of the tools in 2D child window:


-  save inversion result in XYZ format or BMP format
-  Print 2D model section with user specified scale
-  Fill or change fill mode

 Zoom in the model section

 Zoom out the model section

 Redraw the model section

 Change model section size

 Copy model section to clipboard for third part software like Microsoft Offices or PaintBrush etc.

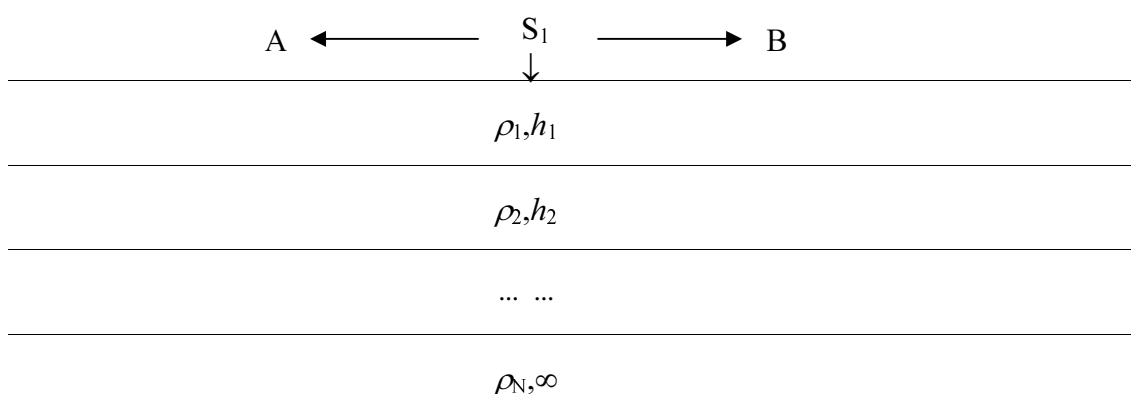
4. 1D inversion with VES2005

1D inversion of VES2005 can be done in two ways: one is interactive inversion which can be done through dialog interaction or mouse interaction. And another is automatic inversion.

Interactive inversion can supply an initial model for 1D automatic inversion.

4.1 What is 1D model?

1D model, often called layered earth, is a basic geo-electrical section in the interpretation of electrical method. And it can be represented by resistivity and thickness of each layer.




1D model is the best approximation of real geological problem when working in the interior of a basin. In other environments, 1D model can supply a reference to interpret.

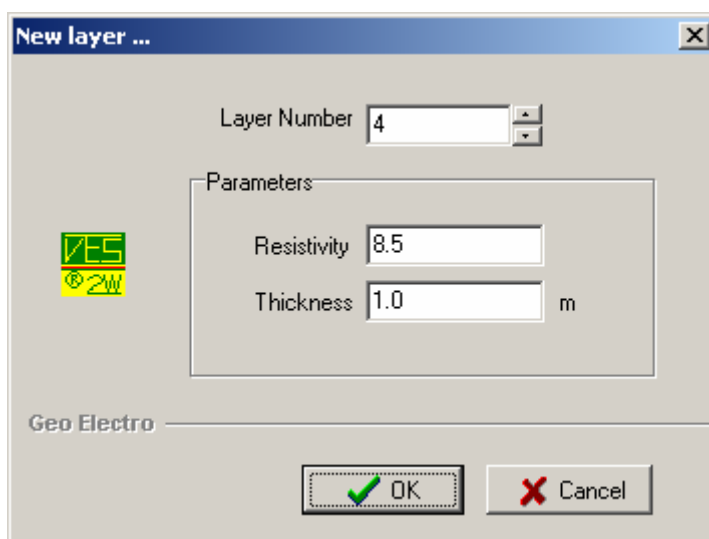
When inverting with 1D model, the layer number, resistivity and thickness of each layer of initial 1D model can be determined by real geological information or measured VES curves. For example, a K-type curve may be from a three layered model.


Initially, the 1D model of each VES curve is three layered earth. And user can change it through following methods to get a proper model.

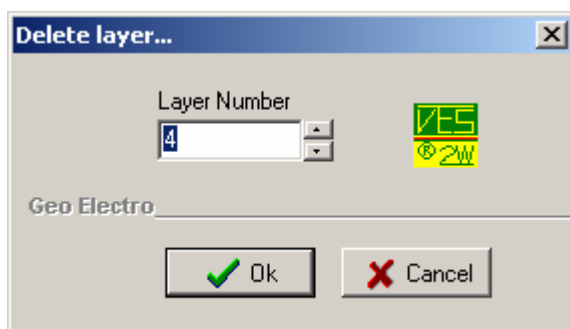
4.2 Interactive Inversion with dialogs

To change 1D model parameters with dialog, user should recognize the 1D inversion tools on tool box.

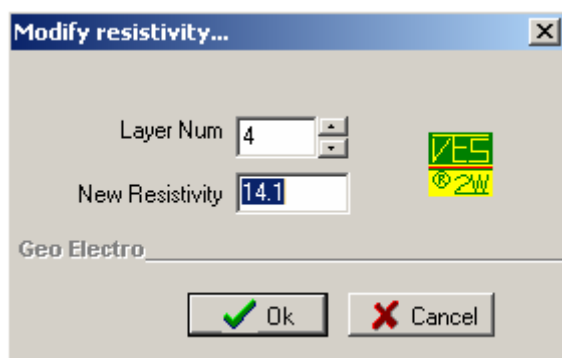
 Insert a new layer below present layer. Once clicked, a dialog appears for user to set new layer parameters:



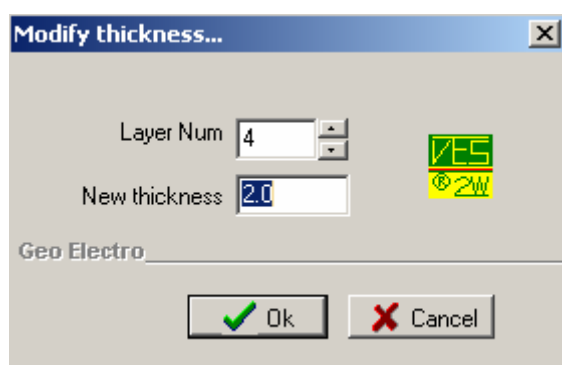
 Delete present layer, default is the first layer.



 Change layer resistivity



 Change present layer thickness:



4.3 Interactive inversion with mouse

Mouse interaction is a much more easy way to complete the 1D inversion in a relatively large error. And to do this, user should know some nomenclatures in the schematic graph in the next page.

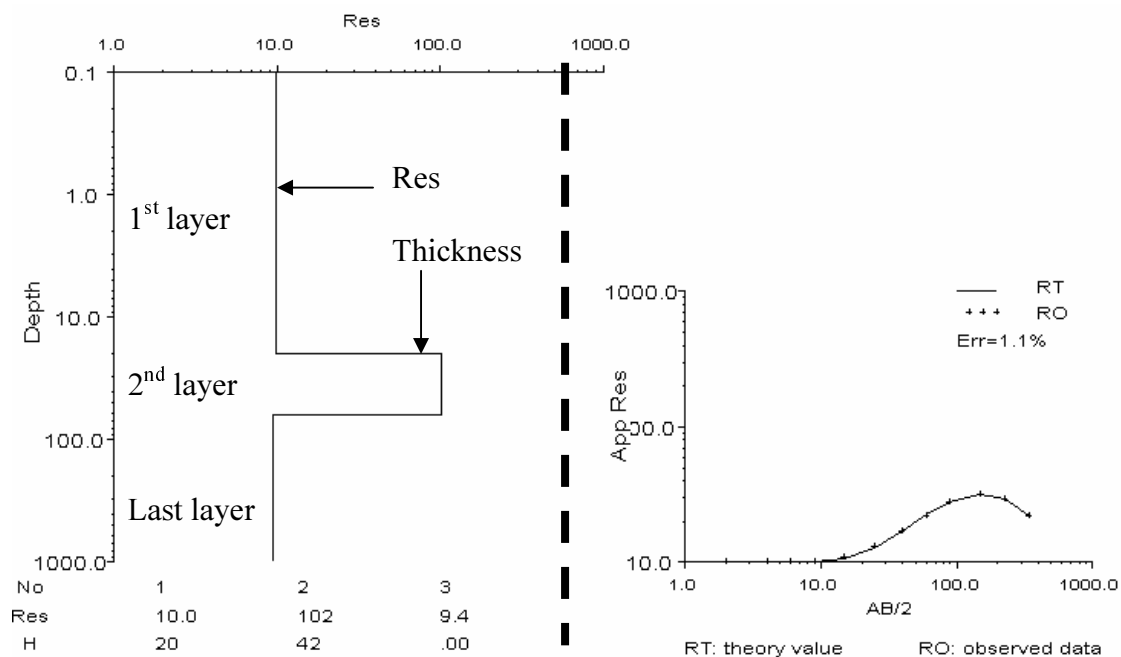
1. Model zone: model curve is plot in this zone, and mouse interaction can be done only in this zone.

2. Data zone: observed field data curve and theoretical response of the model in the Model zone will be drawn in this zone. And they are distinguished by RO and RT.

3. Layer resistivity: they are some vertical lines in model zone. For example, in the plot of following page, the model has three layers, so there are three vertical lines.

4. Layer thickness: They are represented by the horizontal lines which are the bottom face of each layer. For the last layer, the bottom face is not drawn because of the infinite thickness.

5. Fitting Error: For each model, there is a theoretical VES curve, which is represented by solid line or labeled "RT" in data zone. The RMS error between this curve and observed curve is called fitting error. This error is plot as "err=".

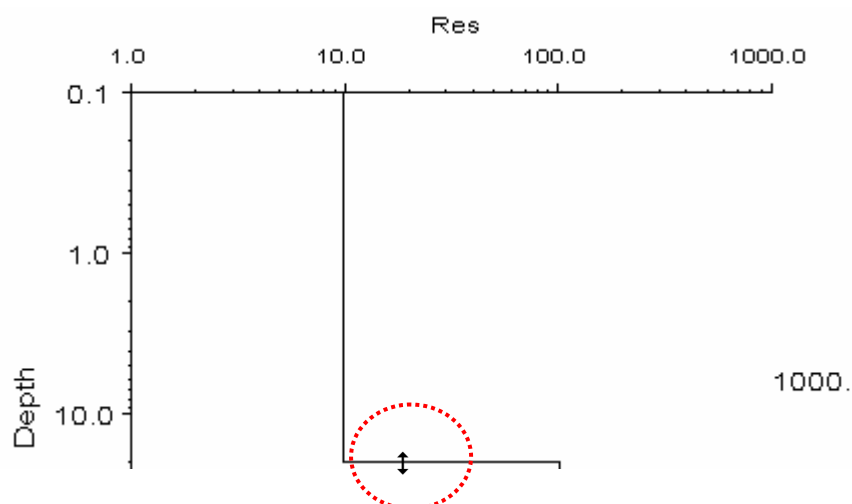


Model zone

Data zone

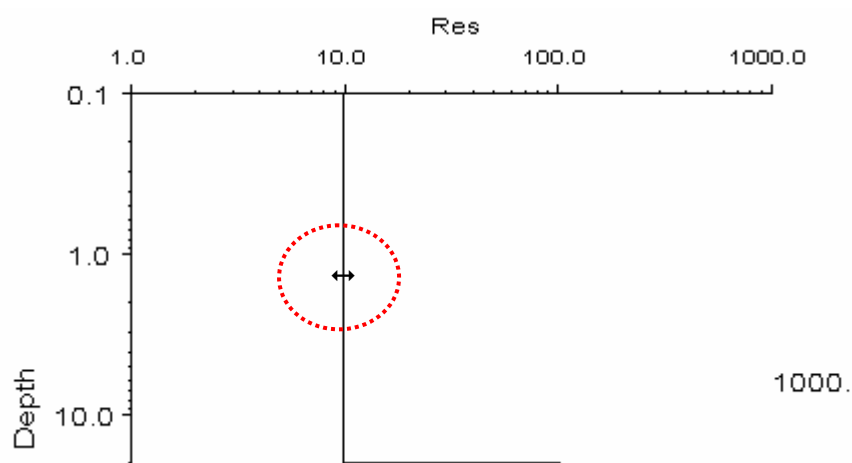
4.3.1 Change a Layer thickness

In order to change a layer thickness, for example, the first layer thickness, you move the mouse right to the bottom interface of the first layer, which is the first horizontal line in model zone, and click down left mouse button, the cursor will change to be like \updownarrow in the following figure. Keep mouse button down and move it up or down, the thickness of the first layer will change at same time, and current layer thickness will be shown in the status bar at the bottom of window. Release the button at an appropriate position, the apparent resistivities of the changed model will be calculated and drawn in data zone to show the fitness.




4.3.2 Change a layer resistivity

Move cursor on the vertical line of the layer which will be changed and down click left mouse button, for example, for the first layer, the first vertical line, the mouse turns to be \leftrightarrow in the following figure. Move mouse right and left to an appropriate position, release the button, a new model is created. And the corresponding theoretical VES curve will be reevaluated and the whole plot in data zone will be updated to show the new fit.



4.4 1D automatic Inversion


Once getting an appropriate initial model from interactive inversion, you can inverse the sounding data with the model automatically. To do this, just click  to execute 1D inversion. The inversion of 1D is very fast, the inversion results can be seen from the data fitting in the data zone immediately.

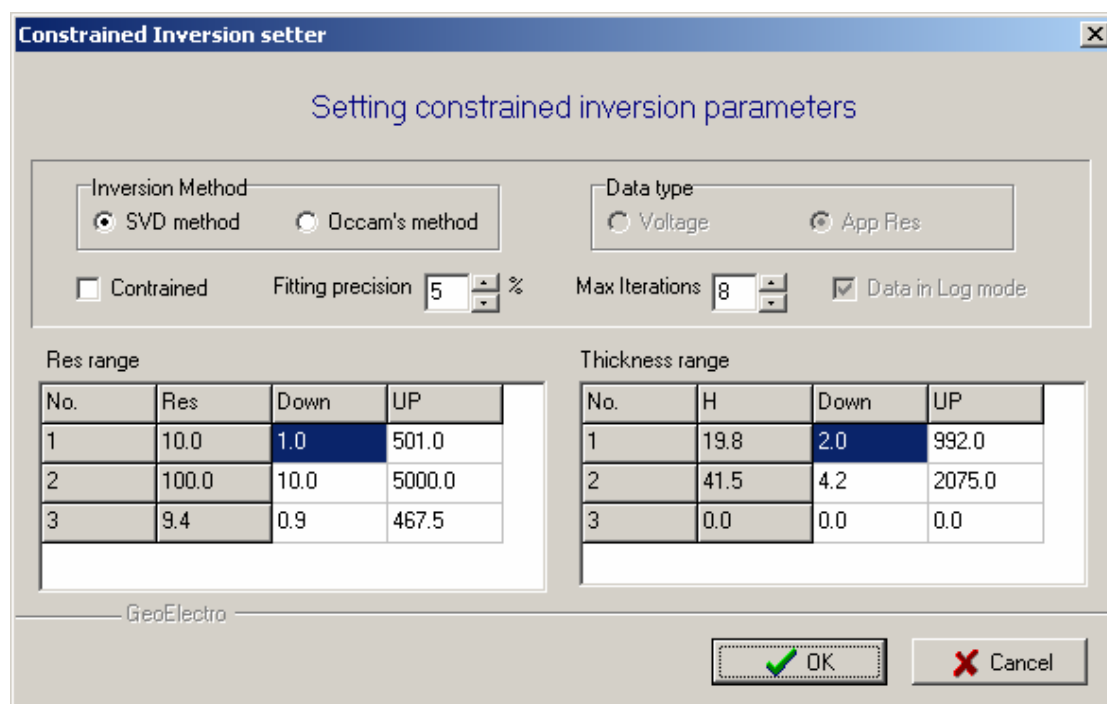
If the initial model is not appropriate, the misfit error may be large, for example, >5%, or the program may warn that the initial model is not appropriate. At this time, you should change the model by mouse or dialog and try again.

4.5 Constrained 1D Inversion

Because of the non-uniqueness of geophysical data inversion, a sounding curve can be fit by several models. This may puzzle interpreter because he could not decide which one is better than others. And some time, user has got some information of local geology and wants to add this knowledge to the inversion result.

In VES2005, this can be done by “**constrained inversion**” by set inversion

controls through the dialog below by clicking 



Constrained Inversion setter

Setting constrained inversion parameters

Inversion Method: SVD method Occam's method

Data type: Voltage App Res

Constrained Fitting precision: 5 % Max Iterations: 8 Data in Log mode


No.	Res	Down	UP
1	10.0	1.0	501.0
2	100.0	10.0	5000.0
3	9.4	0.9	467.5

No.	H	Down	UP
1	19.8	2.0	992.0
2	41.5	4.2	2075.0
3	0.0	0.0	0.0

GeoElectro

In the above dialog, you can set parameter range by change the “**Down**” limit or “**UP**” limit of the “**Res range**” or “**Thickness range**” to constrained inversion result. For example, from logging result that the resistivity of the second layer is $100 \Omega \cdot m$, so in the “**Res range**”, you change the resistivity “**Down**” and “**UP**” limit of the 2 layer to the same value of $100 \Omega \cdot m$. Then during the inversion, the second layer resistivity will be constrained to $100 \Omega \cdot m$. In the same way, you can set data range for other parameters if necessary.

Check “**Constrained**” to inverse with constrained method.

Click **OK** to accept the constraints and run inversion again by click .

Notice that in the dialog, user can select “inversion method”, one is “SVD method”, and the other is “Occam’s method”. And once Occam’s method is selected, inversion will create a smooth model and constrains will take no effect.

4.6 Speedup Inversion

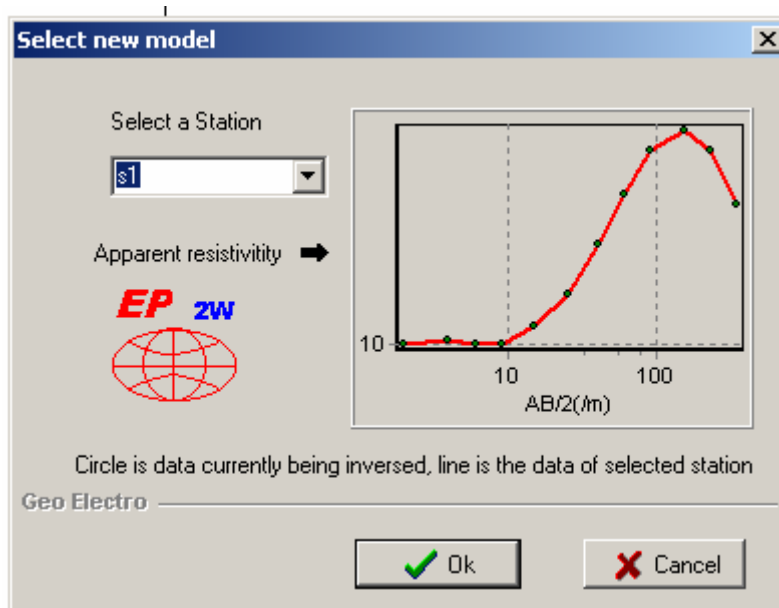
If there are too many stations on a profile, the above station by station inversion may be too bothered. VES2005 gives you two ways to work happily.

4.6.1 Inverse with other models

Once an inversion of a sounding curve for a certain station successes, and in


this station child window, we first right click mouse button in the same inversion child window. A popup menu appears, click “**Save current model**” to save inversed result to main window for save and other use. For example, we have inversed station **S1** . And we save the results.

Now click “**S2**” in the “Stations List” in the main window, the inversion window for **S2** appears. Click right mouse button in S2 child window to launch popup menu, select “Inverse with other models” to bring up dialog like this



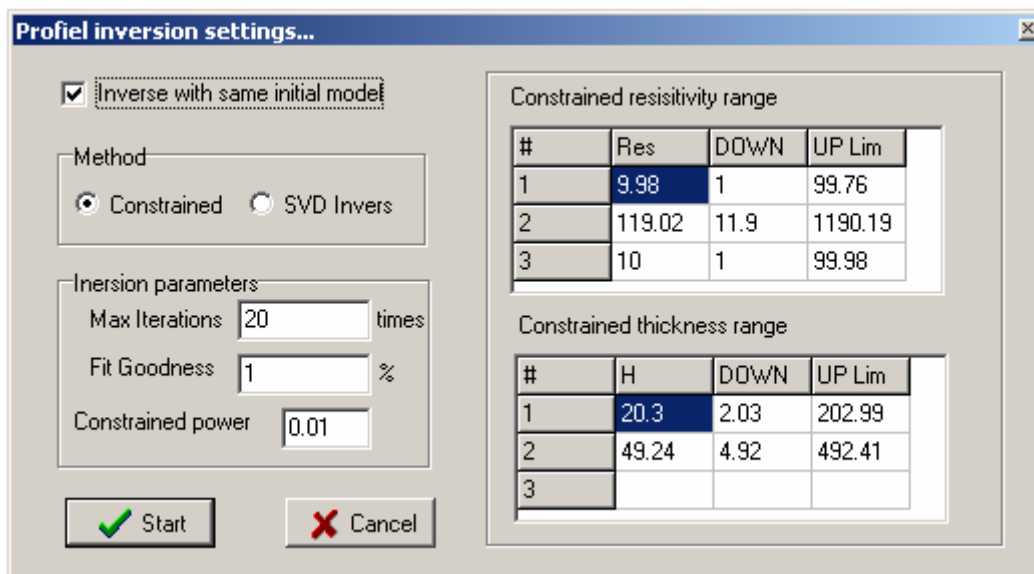
In the right panel of the dialog, apparent resistivity of observed sounding data is shown by solid circles. And the apparent resistivity of the station, here is **S1**, in “Select a Station” in the left panel appear in red line.

By drop down station listbox and select a station, the station curve appear and the discrepancy is shown. We can select a station whose sounding curve is the closest to that of the present station. And click OK to use its 1D model to be the initial model of present station. For example, after comparison, we found that the curve of S1 is very close to that of present S2. After OK, the S2 will use the model of S1 as the initial model.

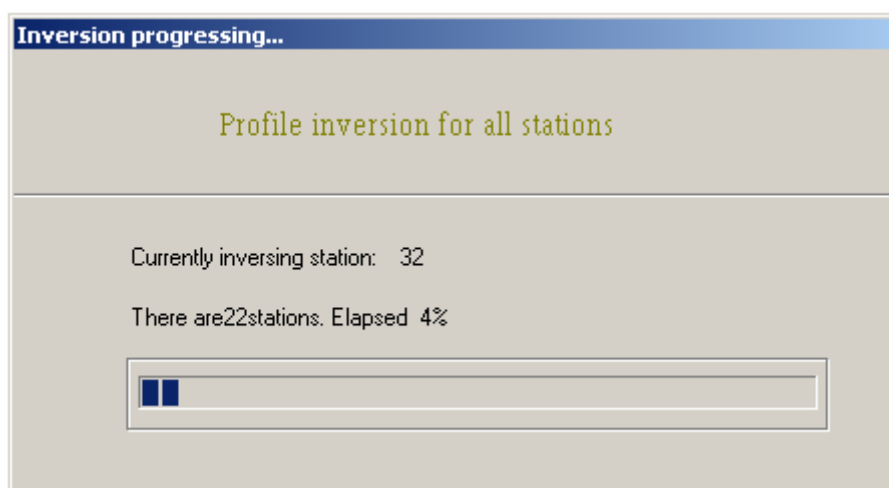
Then if the model is appropriate, just click  to inverse present data. And after inversion, “Save current model” with popup menu.

4.6.2 Inverse all datas

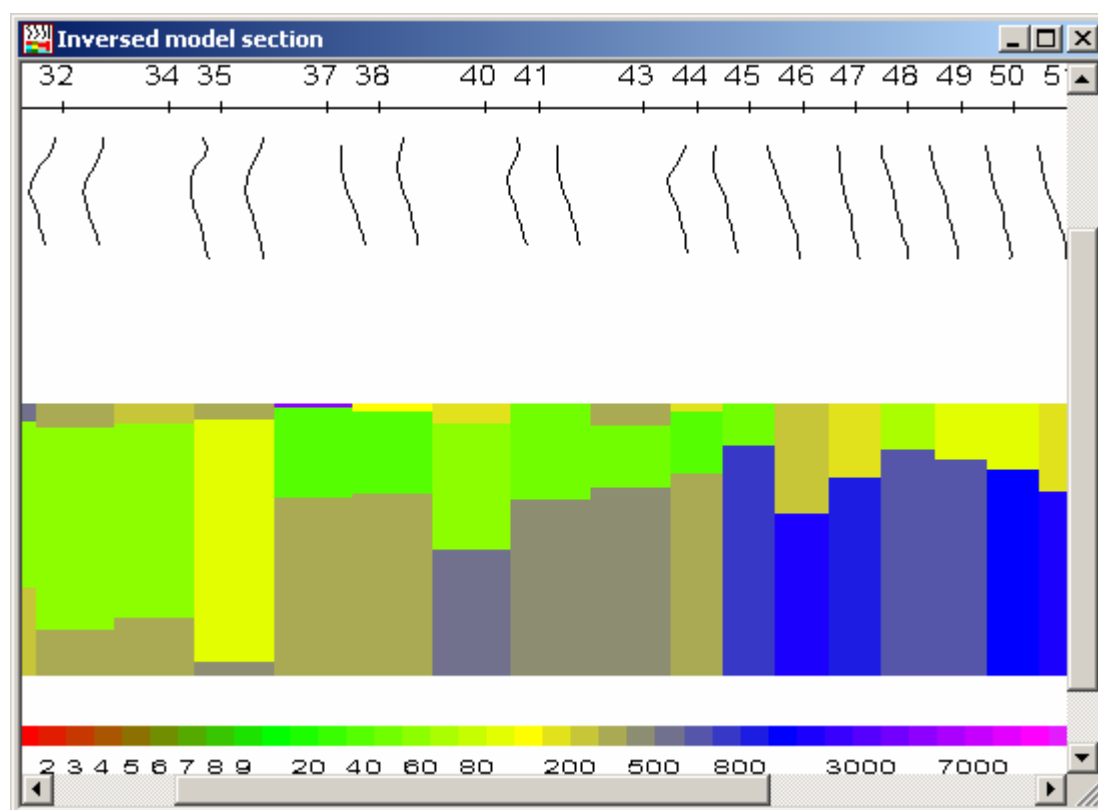
Another inversion speedup is “Inverse all data”. In order to do this, in the “Station List” area of the main window, right click to pop up a menu, select “**Inverse all data**”, after the close of all opened child window, the following dialog is launched.



Setting the necessary parameters, click “Start”, program will execute batch inversion of all stations. And once the inversion startup, an inversion processing dialog is generated to show the progress,



After all sounding data are inverted, a 1D model section child window will show in the following page.



5. Plots and drawings

With the help of **VES2005**, user can draw and plot many standard plots of vertical sounding results, such as sounding curves, pseudo section, and etc.

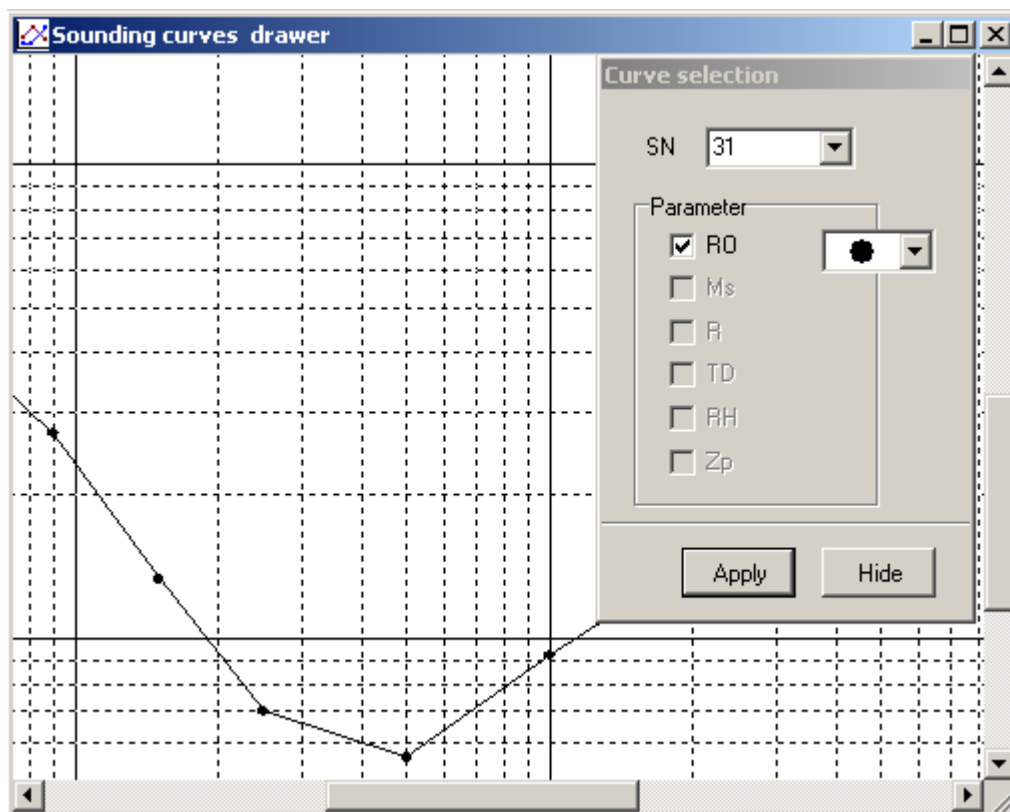
5.1 Sounding Curve

In the program file menu, click “Plots” to drop down submenu, chose “Sounding Curves” sub menu, the log-log 6.25cm module graph of the data for a station will be drawn in the child window.

User can chose stations to plot, and determine which parameter to plot, and specify a legend for the parameter. Click “Apply” to draw the plot(s).

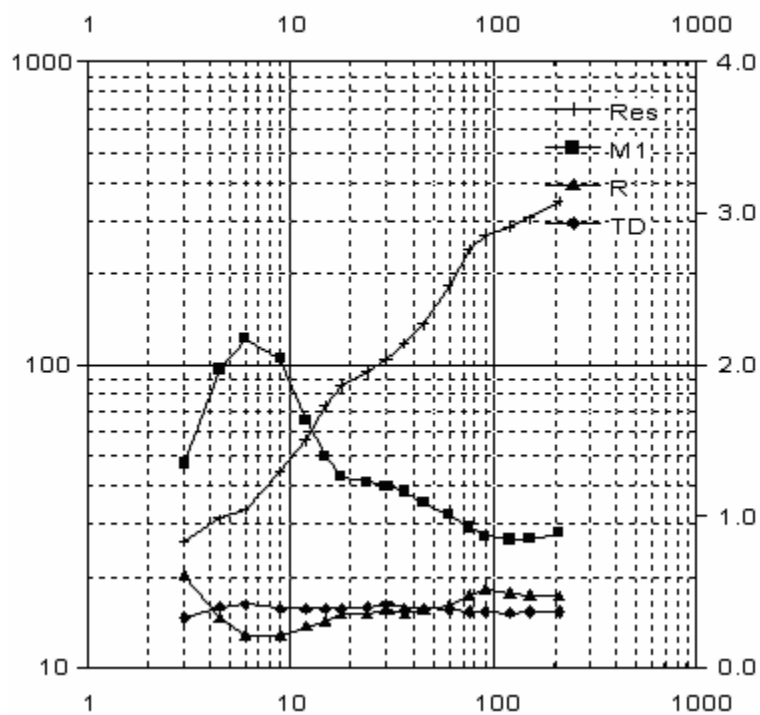
Once the plot is drawn, it can be copied, print, or save as bmp file.

If the file is only for apparent resistivity sounding, there is only one parameter- apparent resistivity can be drawn. But if the sounding is IP sounding, except apparent resistivity parameter, there are chargeability, half decay time, and etc., can be drawn on a same plot.



Here is an example of the sounding curve.

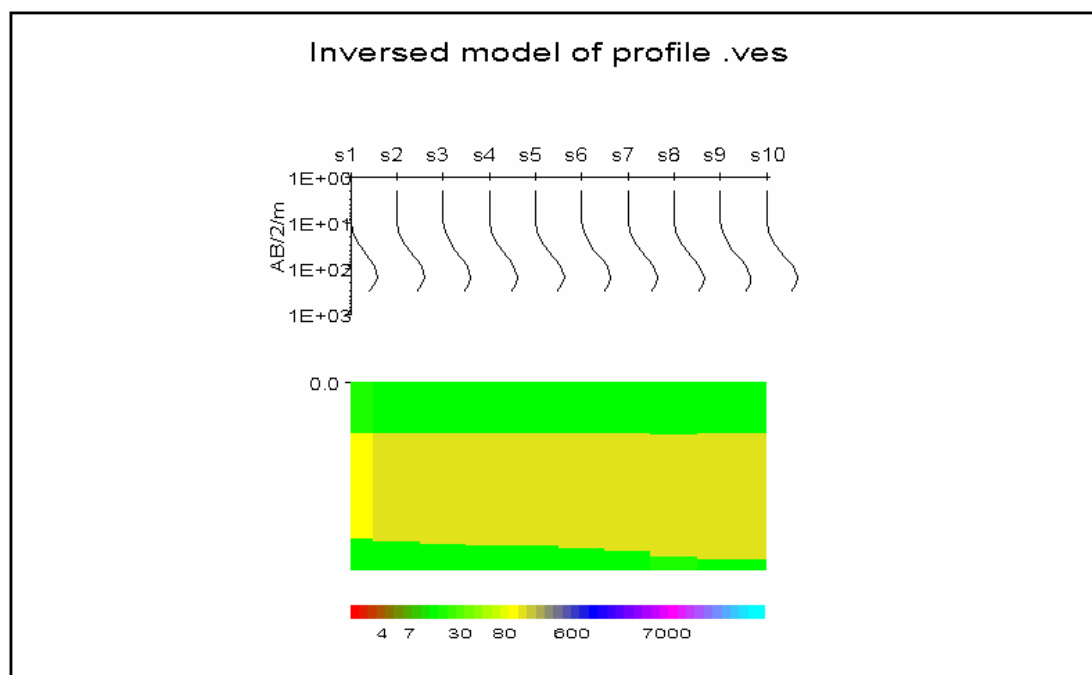
电测深观测数据



Line property can also be changed through a dialog by select a parameter plot.



5.2 1D model section







Once “Inverse all data” complete, or by clicking “Plots” ► “Inversed model section”, or right click in the “Station List” zone to pop up a popup menu, click “Inversed model section”, a child window for the inversed models of all stations on the present profile will be opened.






And a menu called “Model Section” is added to the main window menu, and through which, the appearance of the inversed model section can be changed as desired.

5.3 Pseudo-section

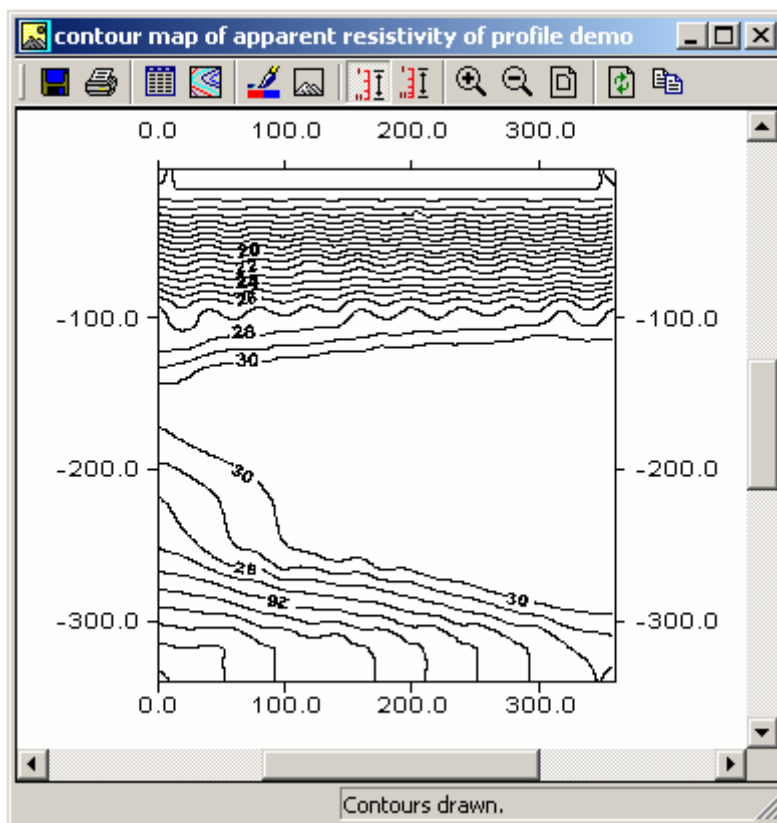
Once a sounding data file is opened, the apparent resistivity Pseudo-section can be drawn by click “Plot” ► “Pseudo-section”, the Pseudo-section will be drawn in a child window. Initially, the y axis (representing AB/2 or Depth) is in linear format. So the icon  is down. Click  icon, the Pseudo-section will be drawn in log format for y-axis.

The Pseudosection can be zoomed in , out , or to any other size . And it can also be copied , printed , and saved .

And the contours can be fill by clicking . And can be recreated by creating new grid , and new contour .

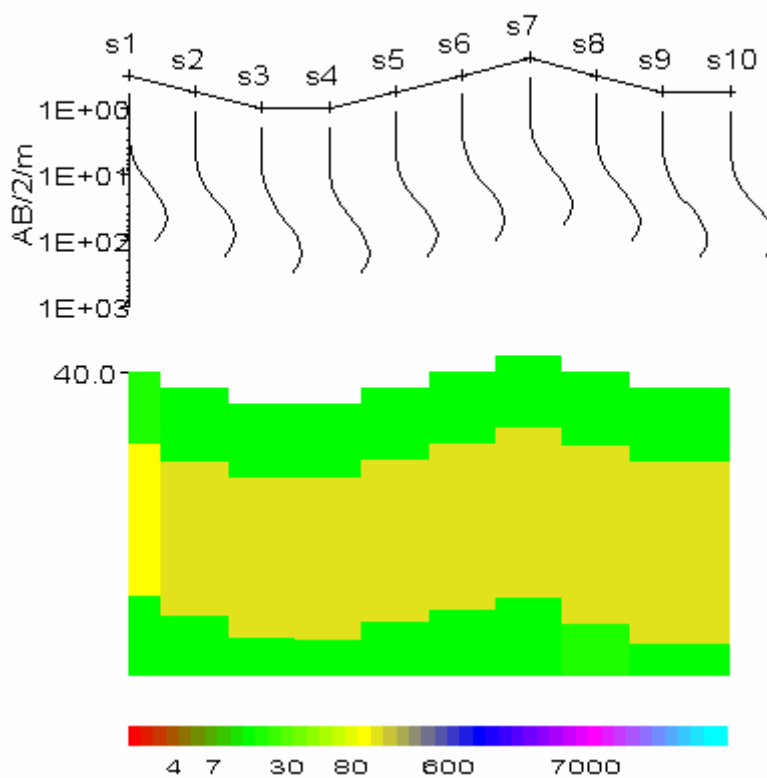
And terrain can be added to the Pseudo-section by clicking . And examples of

this action are

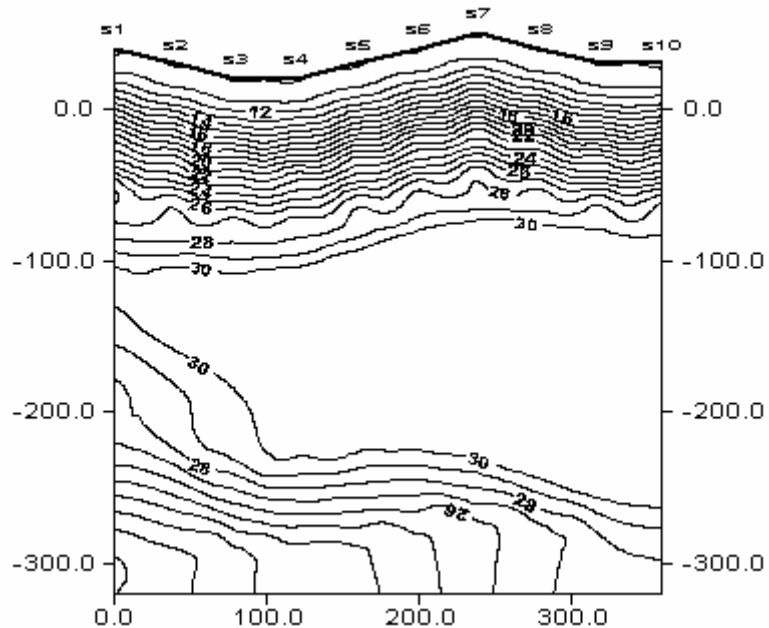


No terrain added

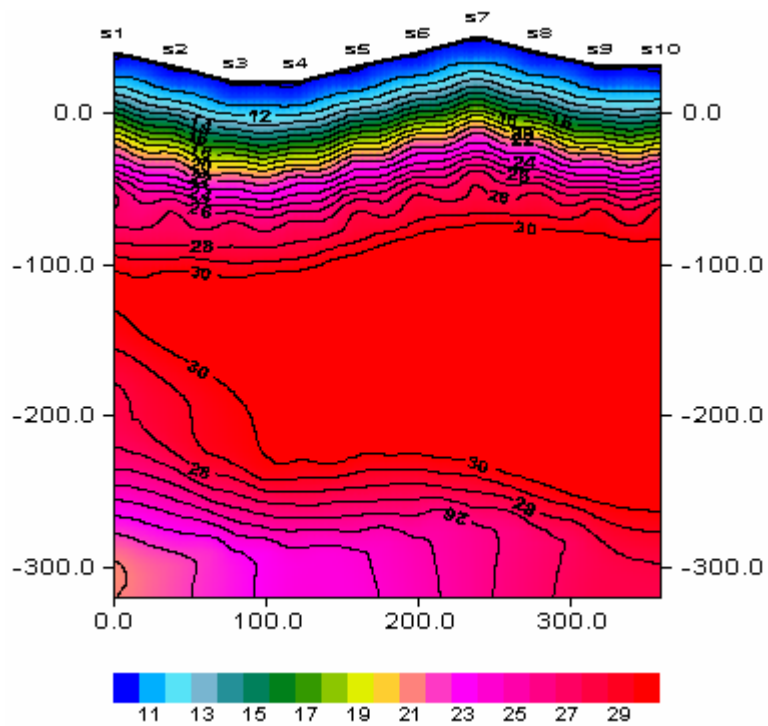
Inversed model of profile .ves



Terrain added



Terrain added



Filled with terrain added

6. Menus and Tools of VES2005

6.1 Menus

File

New	=	New data file with keyboard or RS232
Open	=	Open a old ves or data file
Save	=	Save data and model to a ves file
Save as ves	=	Save data file to be a ves file
Close Present station	=	Close current 1D inversion window
Close profile	=	Close all the working window, save the model and data.
Printer	=	Setup Printer
Print	=	Print
Exit	=	Close VES2005

Plots

Sounding Curves	=	Draw Log-Log curve for apparent resistivity in 6.25cm module
Pseudo section	=	Pseudo-section of apparent resistivity
Pseudo-section of Etas	=	Chargeability Pseudo-section
Pseudo-section of R	=	
Pseudo-section of TH	=	
Pseudo-section of TD	=	
Pseudo-section of Zp	=	
Contours of Equal AB/2	=	Contour map of a certain parameter in a working area for a same AB/2
Inversed model section	=	Draw 1D model section, can include data type plots, model cures in line or histogram mode

Notes:

“Plots” menu has six menu items of Pseudo-section. If a VES file is opened, only apparent resistivity Pseudo-section can be drwan. But if a DAT filed opened, persudeo-sections of six different parameters can be drawn.

ID Inversion

New layer thickness	=	Change the thickness of current layer
New layer resistivity	=	Modify current layer resisitivity
Insert new layer	=	Insert new layer into present model
Delete current layer	=	Delete current layer from present model

- Inversion controllers = Set inversion parameters
- Inverse = Excuter automatic 1D inversion

Graph control

- Title = Change plot title
- Refresh = Redraw current model and curves
- Copy = Copy 1D model plot and data curves to clipboard as image which can be used by third part softs.

2D Section Control

- Refresh = Redraw 2D resistivity model section
- Zoom in = Zoom in model section
- Zoom out = Zoom out model section
- Off set = Move section to a new position
- Set scale = Change map size
- Copy = Copy 2D model section to clipboard as image which can be used by third part softs.

Help

- About VES =
- Contents = Help details of VES2005
- GeoElectro on web = Visit our web, get new software information, download latest version program

Contour Map

- Create Grid = Create regular grid for the data
- Create Contour = Create contour lines for certain values which can be changed later
- Fill = Launch a dialog for color setting, and if accepted, using the specified colors to fill contour lines
- Scale = Change map size with specified scale
- Zoom in = Zoom in map
- Zoom out = Zoom out map
- Offset = Move map to a new position
- Refresh = Redraw contour map
- Copy = Copy contour map as bmp format to clipboard

Note:

Menu “**Contour map**” does not appear untill the “**Pseudo-section**” of observed parameters is drawn.

Model Section

- Hide/Show observed data = Hide or show data type along profile
- Hide/Show Theory data = Hide or show theory data of model along profile


















Hide/Show Model	=	Hide or show model section of 1D inversion
Show model with line/Histogram	=	Show 1D model parameters with line or histogram
Title	=	Change the title of 1D model section
Depth in logarithmic/linear mode	=	If 1D model section is plotted, the depth of the model can be linear or in log mode
Refresh	=	Redraw 1D model section
Copy	=	Copy model section as image to clipboard
Print	=	Print current 1D model section

Note:









“**Model section**” will appear only after a data file opened and the menu item “**Inversed model section**” in “**Plots**” is executed.

6.2 Tools


6.2.1 Main window tools


 Open	 modify layer resistivity
 new	 modify layer thickness
 equal AB/2 contour map	 insert new layer below
 Save as	 delete current layer
 Save	 set inversion control
 Printer	 set constraints
 Refresh	 automatic 1D inversion
 Copy	 2D Inversion
	 Help


6.2.2 Pseudo-section tools

 save as BMP or XYZ file	 Add terrain
 Create new grid	 y-axis in Linear format
 Create new contours	 y-axis in LOG format
 Fill contours	 Zoom in


 Zoom out


 Change scale


 refresh


 copy


6.2.3 Sounding curve Tools


 x-axis length

 y-axis length

 title

 line property

 show/hide legend

 show/hide control dialog

6.3 Popup Menus

6.3.1 Popup menus in “Station List”

Inverse all datas	=	Profile inversion for all stations
2D inverse	=	Inverse data with 2D model
Inversed model section	=	Show inversed 1D model section in a child window
Modify station coordinates	=	Change the coordinates of each station along present profile.
Delete current station	=	Delete current station from present profile, along with the data.

6.3.2 Popup menus in 1D inversion child window

New layer thickness	=	Change the thickness of current layer
New layer resistivity	=	Change the resistivity of current layer
Insert new layer	=	A new layer will be insert below current layer
Delete current layer	=	Current layer will be deleted from model
Inverse with other models	=	Use other model as the initial model of present data
Auto Inverse	=	Inverse data with current model automatically
Save Current model	=	Update the inversed model in the present child window to main window.

6.3.3 Popup menus in Pseudo-section window

Create Grid	=	Create a new coarse or dense regular grid
Create Contours	=	Generate new contours with new value list
Zoom in	=	Zoom in present contour plot
Zoom out	=	Zoom out present contour plot
Title	=	Change the plot title
Top border	=	Reset property of top axis
Left border	=	Reset property of left axis
Bottom border	=	Reset property of bottom axis
Right border	=	Reset property of right axis
Contour lines	=	Set the property of contour lines
Station labels	=	Add or delete labels above contour plot
Refresh	=	Redraw the contour plot with present settings
Scale	=	Change the size of present plot

Offset = Change the position of present plot

6.3.4 Popup menus in keyboard input dialog

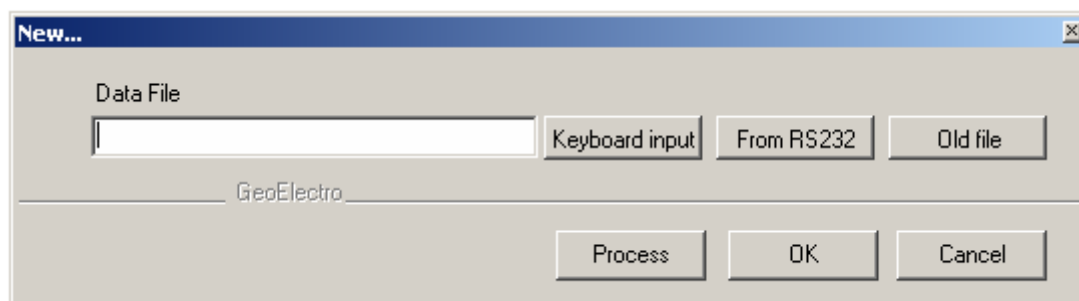
Insert new line	=	Insert a new line which is for input of new AB/2 and the corresponding observed data
Delete current line	=	Delete a AB/2 and its data at in current line
Insert current station	=	Save all data of a station. This should be done when the data of present station is input completely. And only execute this command, the data of next station can be input.
Update current station	=	Update the data of current station. When we brows the data input of each station and find some error input. After the correction, the corrected model should be updated. Otherwise, the correction will take no effect.

6.3.5 Popup menus in Data Processor

Print	=	Print processing results
Copy	=	Copy processing results to clipboard
Plot size	=	Change plot size
Smooth with mouse	=	Correct error data with mouse
Tri-point filter	=	Smooth error data with tri-point filter
Five-point smooth	=	Smooth error data with five-point filter
Terrain correction	=	Correct terrain effect

7. NEW data

To new a data file, click  button to launch following dialog,



There are three ways to create a new file:

Keyboard Input,

From RS232, and open

Old file.

Once a data file is created or opened by above three means, the data in the file can be processed by click button “**Process**”.

7.1 Keyboard Input

To input data with VES2005, user should fill the following tables.

The screenshot shows the 'Data inputter' dialog box. The 'Station information' section includes fields for Station Number (S1), Profile Number (Profile), Working Area (WorkArea), x (0), y (0), z (0), Operator (Operator), and Instrument Type (DZD). The 'Data type' section has radio buttons for 'VES with only appres' (selected) and 'IP VES'. The 'AB Number' is set to 13. The 'Observed' table is as follows:

#	AB/2	AppRes
1	1.5	
2	2.5	
3	4.0	
4	6	
5	9	
6	15	
7	25	
8	40	
9	60	
10	90	
11	150	
12	225	
13	340	

The 'Data browser' section has 'Previous' and 'Next' buttons. The footer includes the EP 2W logo and buttons for 'Print', 'New', 'Save', and 'Exit'.

To use the dialog properly, user should obey the following rules:

Select “**Data type**”, Fill necessary “**Station information**” of a station, Input “**Observed**”. After all the data for a sounding curve of one station is completely input, user **MUST** click “**Insert Data**” to save current input. Only after this operation can user input the sounding data of next station. So a path of input is:

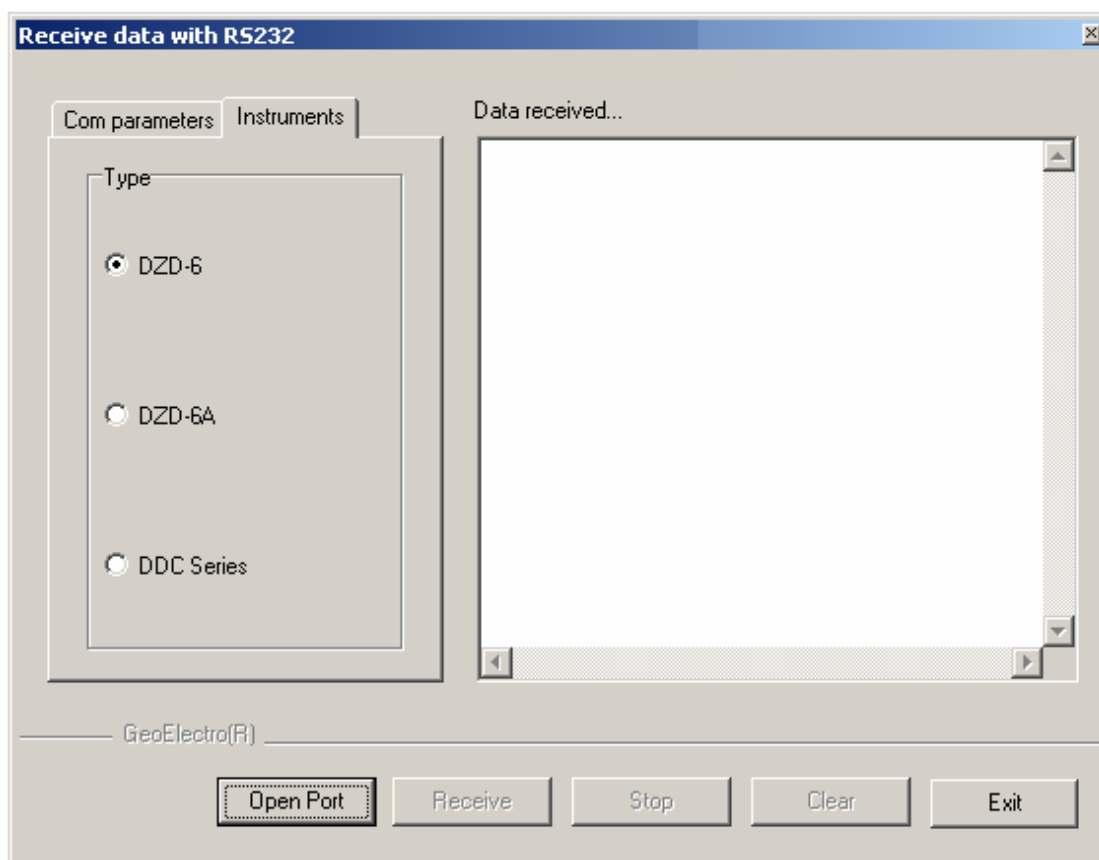
Input a station data completely ►► “**Insert data**” ►► Input another station sounding data ►► “**Insert data**” ►► And so on until the last station, and then ►► “**Save**” before “**Exit**”.

Buttons in “Keyboard input”


Data browser	=	If several data have been input, user can brows them by clicking “Previous” or “next”. And the error input can be done through this way cooperating with “Update current station” popup menu item
Print	=	Print data of all stations
New	=	New a profile input. If the input of all the stations of a profile completed, and user want to continue to input other profile station data, “New” button can be clicked to save current profile data and reset input status for new inputting.
Save	=	Save all the data of all the stations. If the specified file already exists, a dialog will open to hint how to deal with.

7.2 From RS232

Click “From RS232” will popup following dialog for user to transfer data in apparatus of CGIF to computer.



How to use RS232?

- ❶ Connect apparatus and PC with RS232 cable;
- ❷ Run VES2005, Click **new tool** , Click “From RS232”, in the “Receive data with RS232” dialog, click “**Open Port**” then click “**Recevie**” button to set program into waiting status;
- ❸ Operating on CGIF instruments to transfer data by the operating steps described by CGIF user’s manual;
- ❹ Once completing data transferring on CGIF instruments, click “**Stop**” button in the dialog;
- ❺ Click “**Exit**” button to save received data and close data transferring dialog.

Attention Please:

“COM parameter” panel should not be changed unless you know the exact parameter of COM port.

Select proper “Type” of “Instruments” according to your instrument used currently, otherwise, data may be wrong saved.

Suggestion:

Once the data transferred, user should backup it immediately. The raw data is valueless.

7.3 Why “Old files”

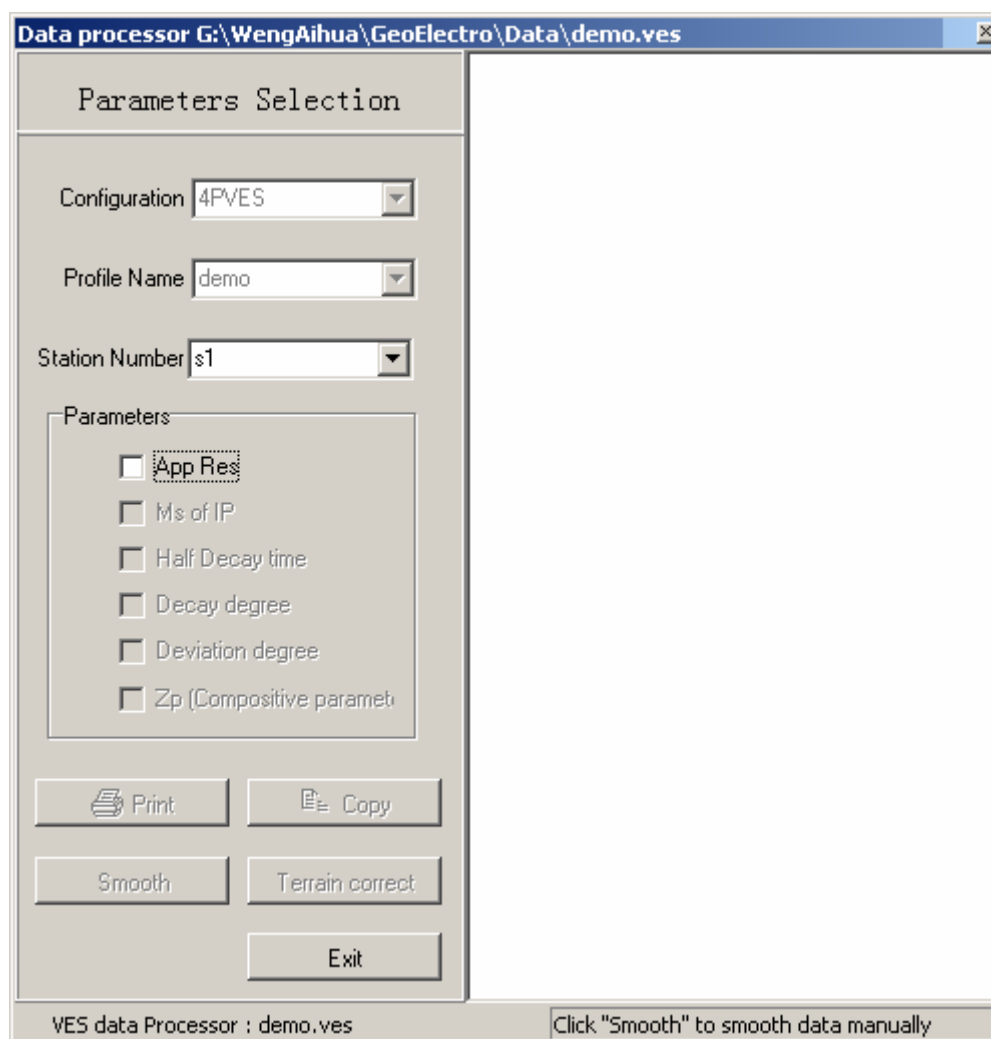
To **process** an already existed data file, user must do it in the following steps:

1. New  a data file; and 2. click “**Old files**” to open an old file; 3. Click to “Process” data.

“**Old files**” is useful when user input several profiles a time and want to process lately.

7.4 Preprocess

Once a valid data file is opened in the “**Data file**” text box of “**New**” dialog, click “Process” button, data processing dialog will open as below.



To **Process** the data of a VES sounding station includes:

- ① Select “**Station Number**”;
- ② Check “**Parameters**” to be processed;
- ③ Down “**Smooth**” to smooth error data by mouse or automatically;
- ④ Click “**Terrain correct**” to set terrain position to correct terrain effects.

When terrain is fluctuant greatly, the terrain effect on apparent resistivity must be corrected. For other parameters, no correction needs. And for middle gradient configuration, not only the main profile, but the lateral profiles can be corrected of terrain effect.

Appendix: Files used

There are several types of files used in our system, and they are all in ASC text format.

A.1 VES file

VES file save only apparent resistivity and interpreted models. And the data in the file is organized in such format that the data of each station is continuous by that of other stations.

A.2 DAT file

Dat file contains the data of induced polarization sounding method. That is, the apparent resistivity, chargeability, half decay time, and other parameters measured by CGIF instruments for certain AB/2s.

This format file can be opened by VES2005, the apparent resistivity can be inverted both in 1D mode or 2D model. And other parameters measured can be plotted in curves of in Pseudo-section format.

A.3 XYZ file

XYZ file is an opened text file, which contains only three data columns, and the first , second and third column represents x-position, AB/2 or depth and observed data or other parameter values.

And the file can be used as input of SURFER and other third part professional programs.

A.4 POS file

Pos file save the terrain information of profile or position of all the stations of a profile.