



Geo-Vista

PIView Software & Logging Analysis

PIView

Petrophysics

Data Analysis

Geology

Sonic View

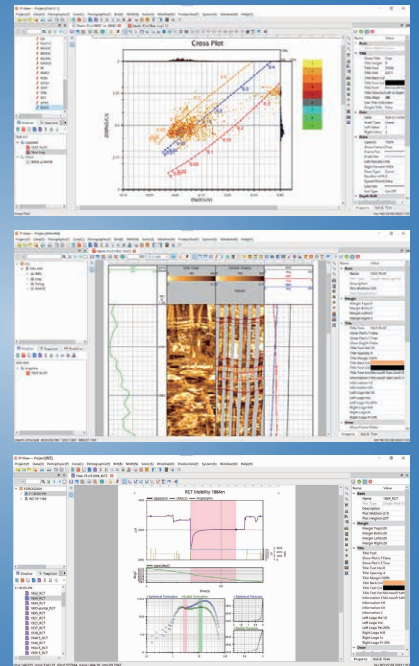
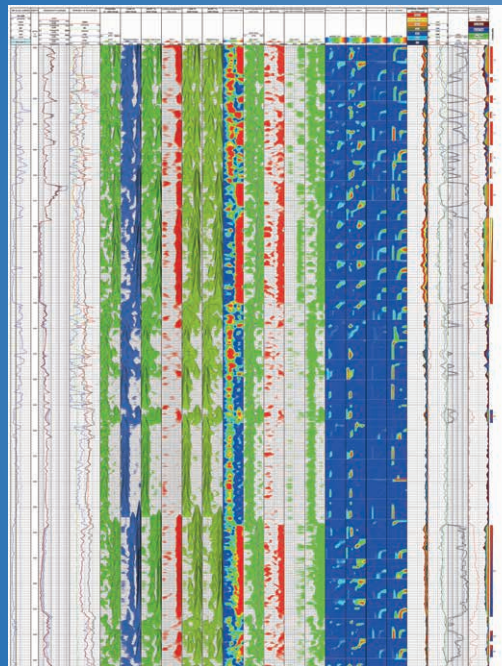
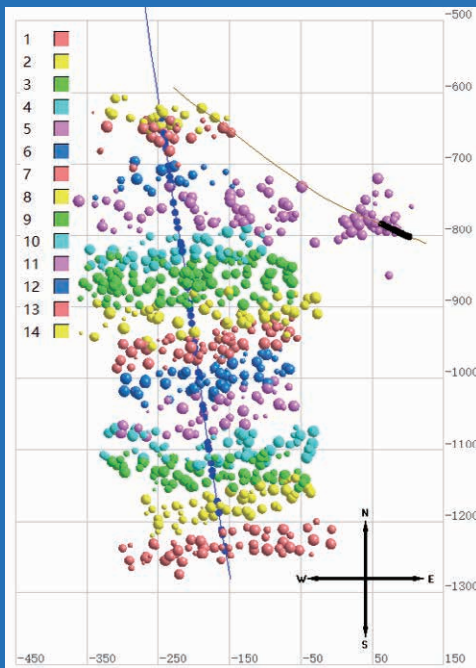
Mobility Analysis

Reservoir Monitor

3D View

NMR 2D/3D

Microseismic Monitoring Data Processing & Interpretation Software (MMDPI)



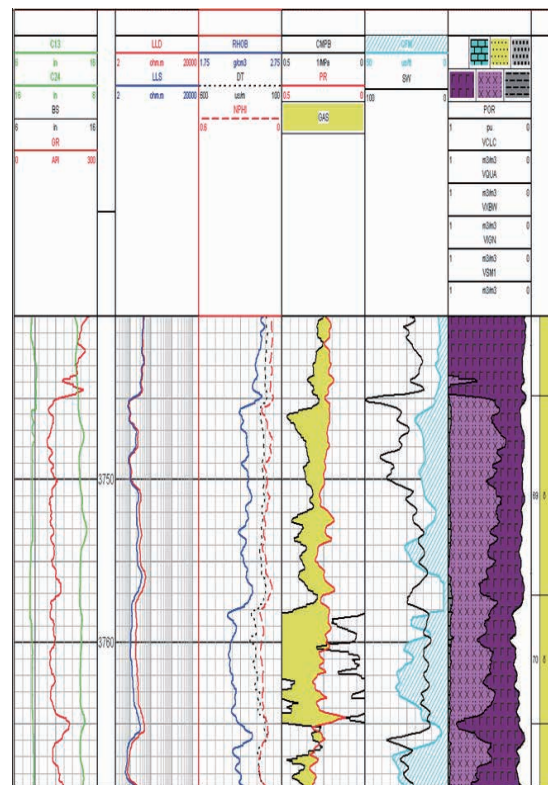
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Log Analysis Computations mainly include: petroleum exploration and development data and database, reservoir study, reservoir engineering, geological study and appraisal, logging data processing and evaluation; technical development, transferring, consultation, service and training related to geology, reservoir study and logging; software development.

Main services:

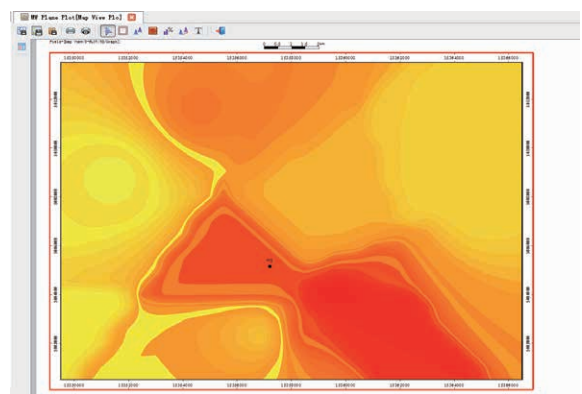
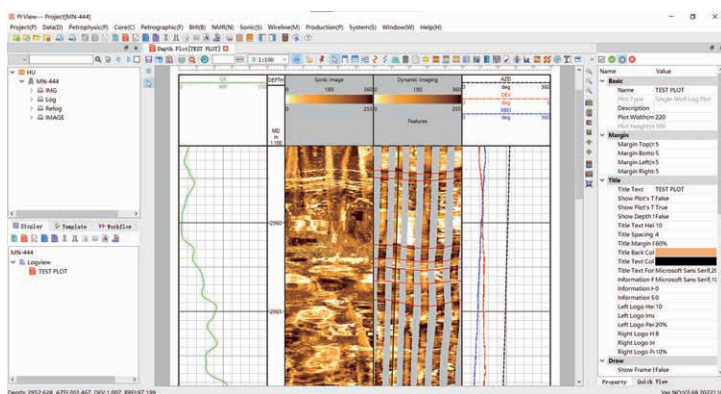
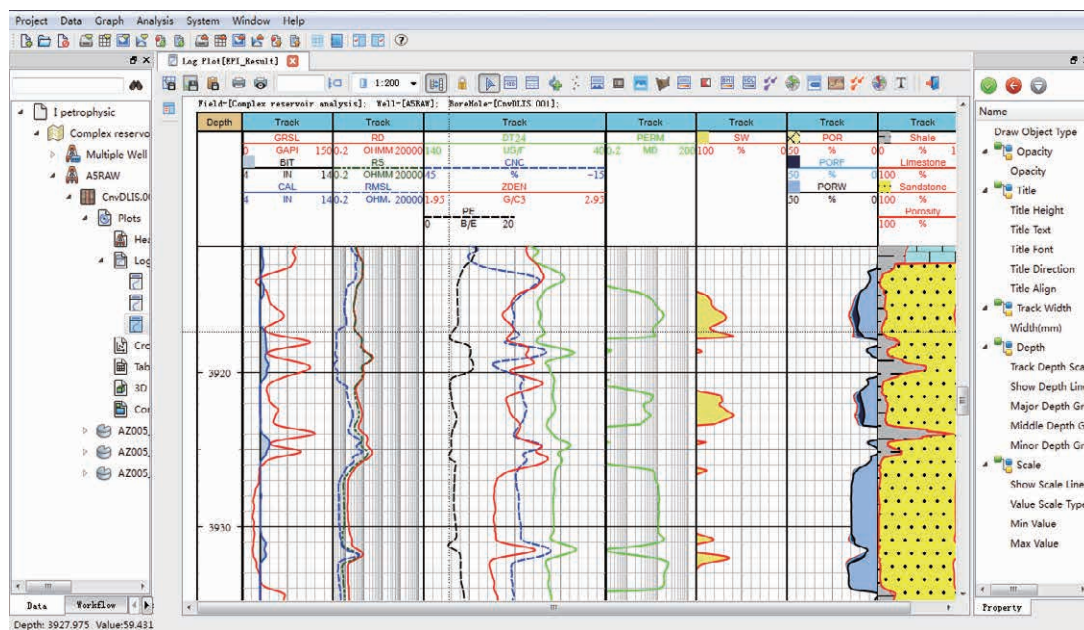
- Logging data hydrocarbon appraisal and reservoir parameter calculation (sandy mudstone reservoir, complex lithology reservoir and fractured reservoir);
- Processing and comprehensive appraisal of special logging data such as acoustoelectric imaging and nuclear magnetic logging data;
- Matching and reversion of high resolution induction logging data;
- Processing of long space and multi-pole array acoustic logging data;
- Processing of logging data such as neutron lifetime and C/O logging data and comprehensive appraisal of water-flooded zones;
- Relationship among reservoir (lithology, electrical property, physical property and oil bearing property) and reservoir hydrocarbon appraisal;
- Processing of logging sedimentary facies data, study of sedimentary facies and sedimentary environment and comprehensive study of petroleum geology;
- Formation testing data analysis and reservoir productivity prediction;
- Logging data geological thin layer comparison, interpretation of structure and integration of sedimentary facies study to determine earth stress direction;
- OIP calculation
- Provide specialized technical services and method studies:
- Method study and evaluation for fine interpretation of permeability;
- Prediction of reservoir productivity by taking use of wireline formation testing data and nuclear magnetic resonance logging data;
- Study on interpretation method for monitoring data of condensate reservoir development performance;
- Evaluation of rock pore structure using reservoir permeability method (sphere-cylinder model);
- Application of nuclear magnetic relaxation time analysis on rotary sidewall coring sample;
- Theoretical model and effect analysis of evaluation method for heterogeneous reservoirs.



PIView (Petroleum Integrate View) is a borehole logging data processing and analysis software platform.

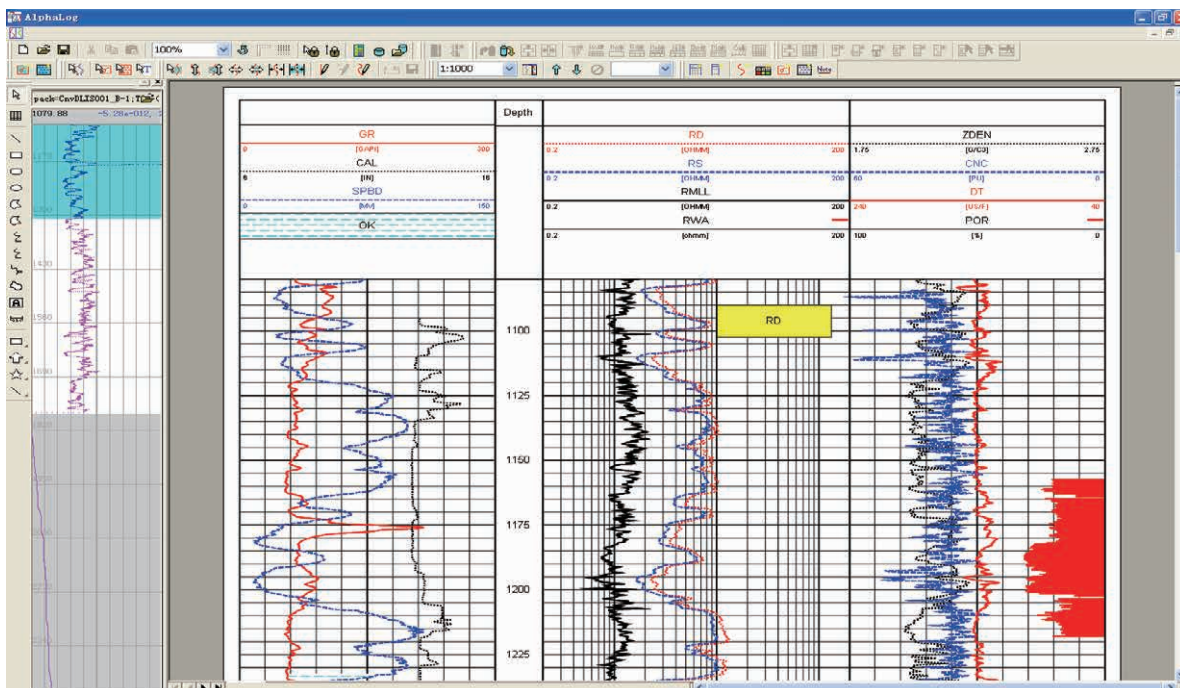
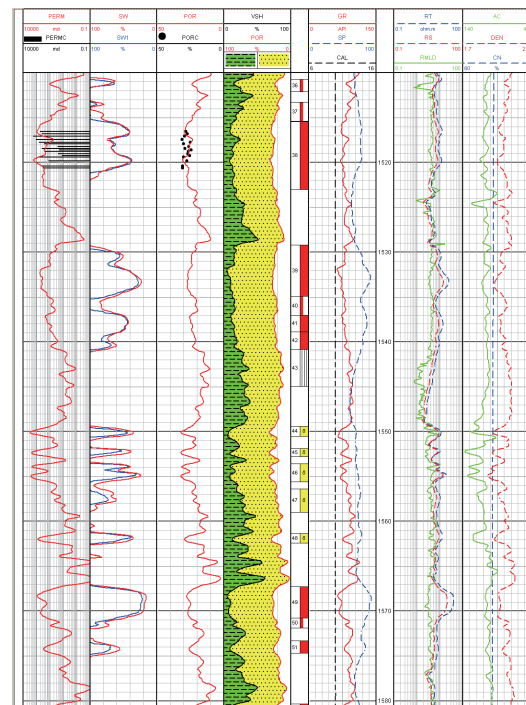
PIView Include : logging data import, data management, cross-plot, environmental correction, petrophysical analysis, mineral content calculate, reservoir fluid analysis, petrographic analysis, data statistical analysis and other functions.

PIView can processing various companies conventional logging data, imaging logging data, multi-array acoustic logging data, wireline formation test, core analysis, C/O, production logging data.

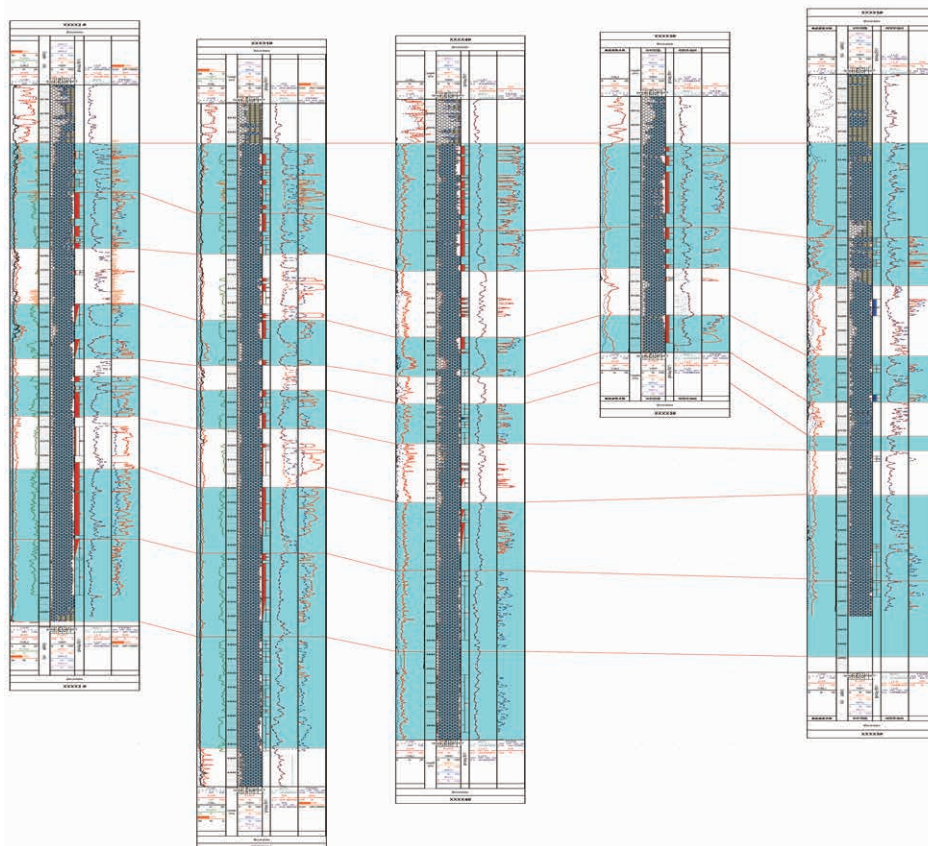
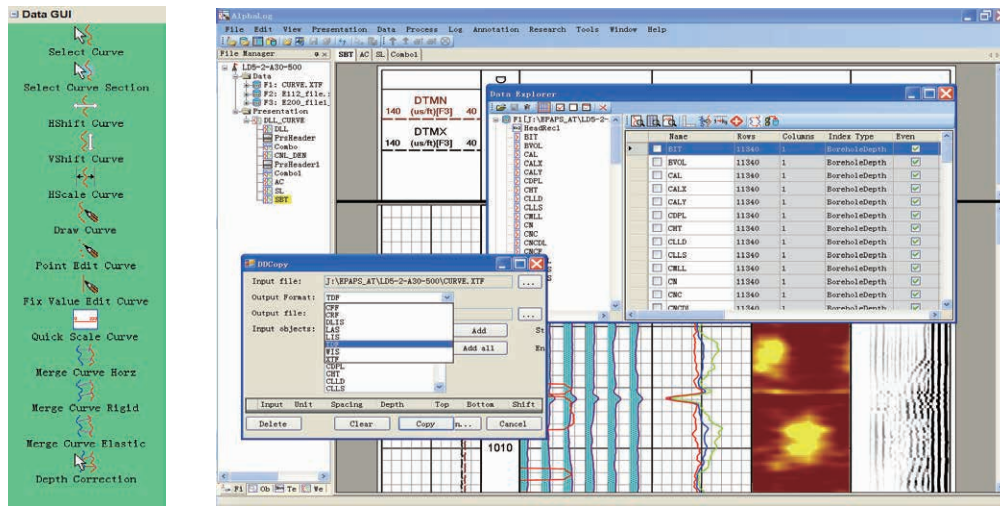


Petrophysics module is a log management and analysis software product based on “Graphics Paradise 2D graphics application development package” and “GeoData universal geological application data drive development package”.

- “Graphics Paradise 2D graphics application development package” is a universal graphics application development package based on Windows GDI+. You can use the software to develop different types of high-quality commercial interactive applications, such as CAD.
- “GeoData universal geological application data drive development package” is a universal geological application data drive development package built through fully analyzing and understanding the application characteristics of petroleum geology.



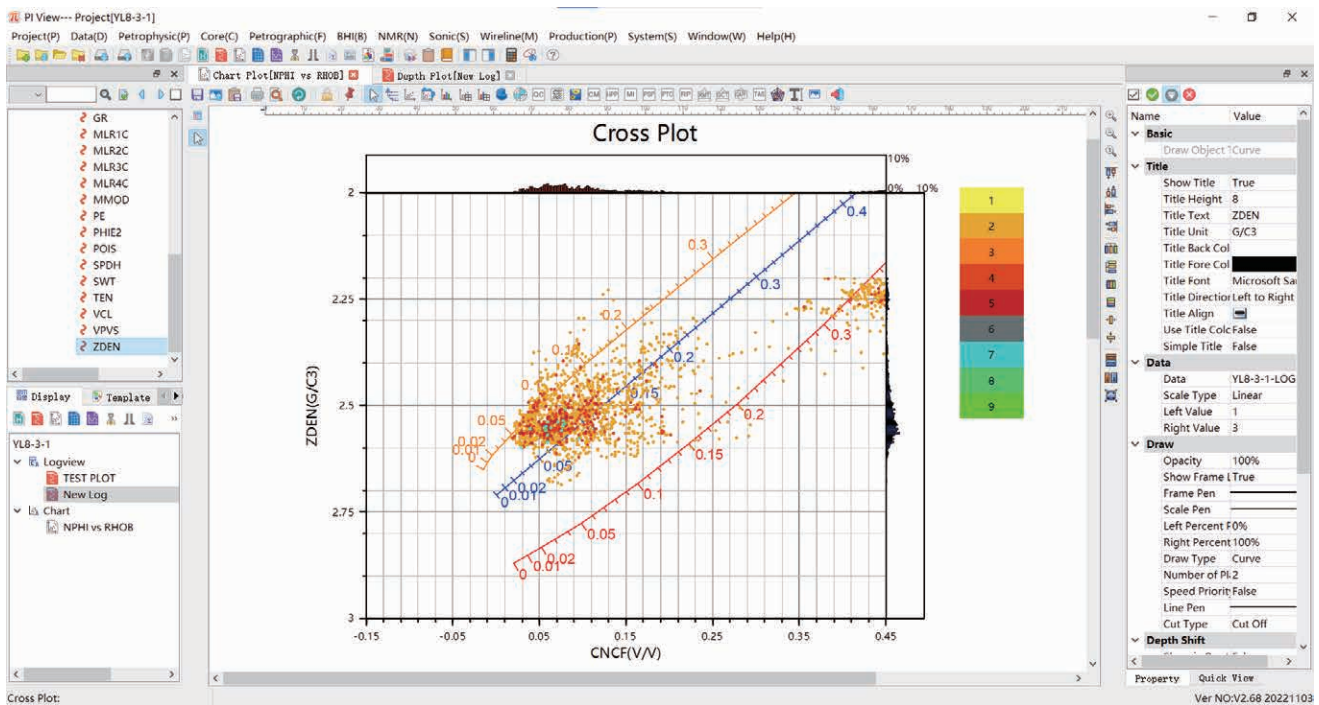
- Petrophysics module exhibits excellent data management, comprehensive graphic display, unique crossplots, professional data analysis, convenient interpretation model definition and other characteristics. It is suitable for analyzing and interpreting logging, geologic, reservoir and oil-field development data.



Data analysis is a module about comprehensive data analysis. It combining with logging cross plot, forms excellent interactive data analysis capability.

The data analysis graphics tools of the software include multiple analysis graphics tools, such as Cartesian coordinate system scattergram, Cartesian coordinate system frequency cross plot, triangle coordinates scattergram and normal distribution map, etc. Especially the regression command provided by the system permits users to work out any function formula according to their own imaginations for sample data regression, thus providing extremely great convenience for data analysis works.

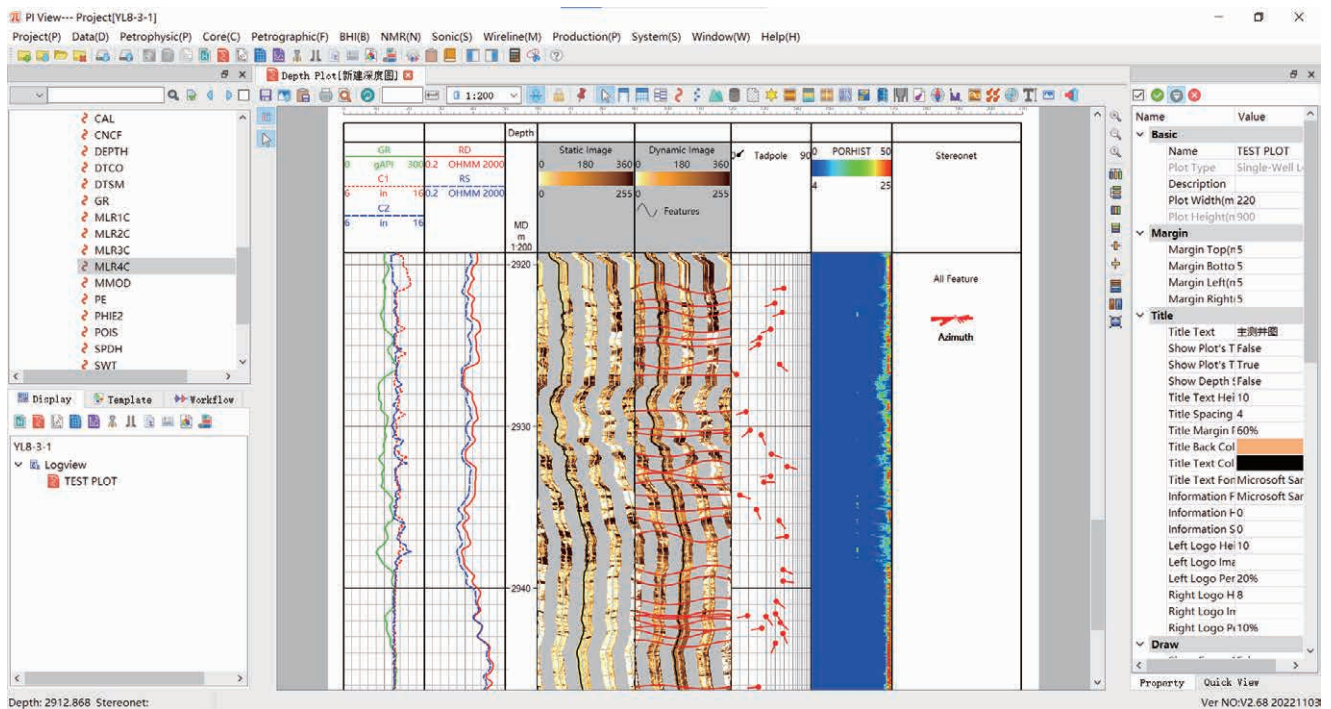
- Analysis of the optimal subset regression for data and regression analysis based on data integration method, and interactive graphic analysis for functions under the Cartesian coordinate system;
- Analysis of frequency crossplots of statistics and the related mode templates, scatter data under the triangular coordinate system and the probability plot data in normal distribution;
- Module supports cross plot, data pie chart, statistical histogram, radar plot, waveform playback plot, spectrum chart, rock and mineral triangle chart, borehole trajectory chart, etc;
- Supporting Tdf, txt, xls, Las and other graphic files.



Geology is a comprehensive interpretation module for processing and appraising imaging logging data.

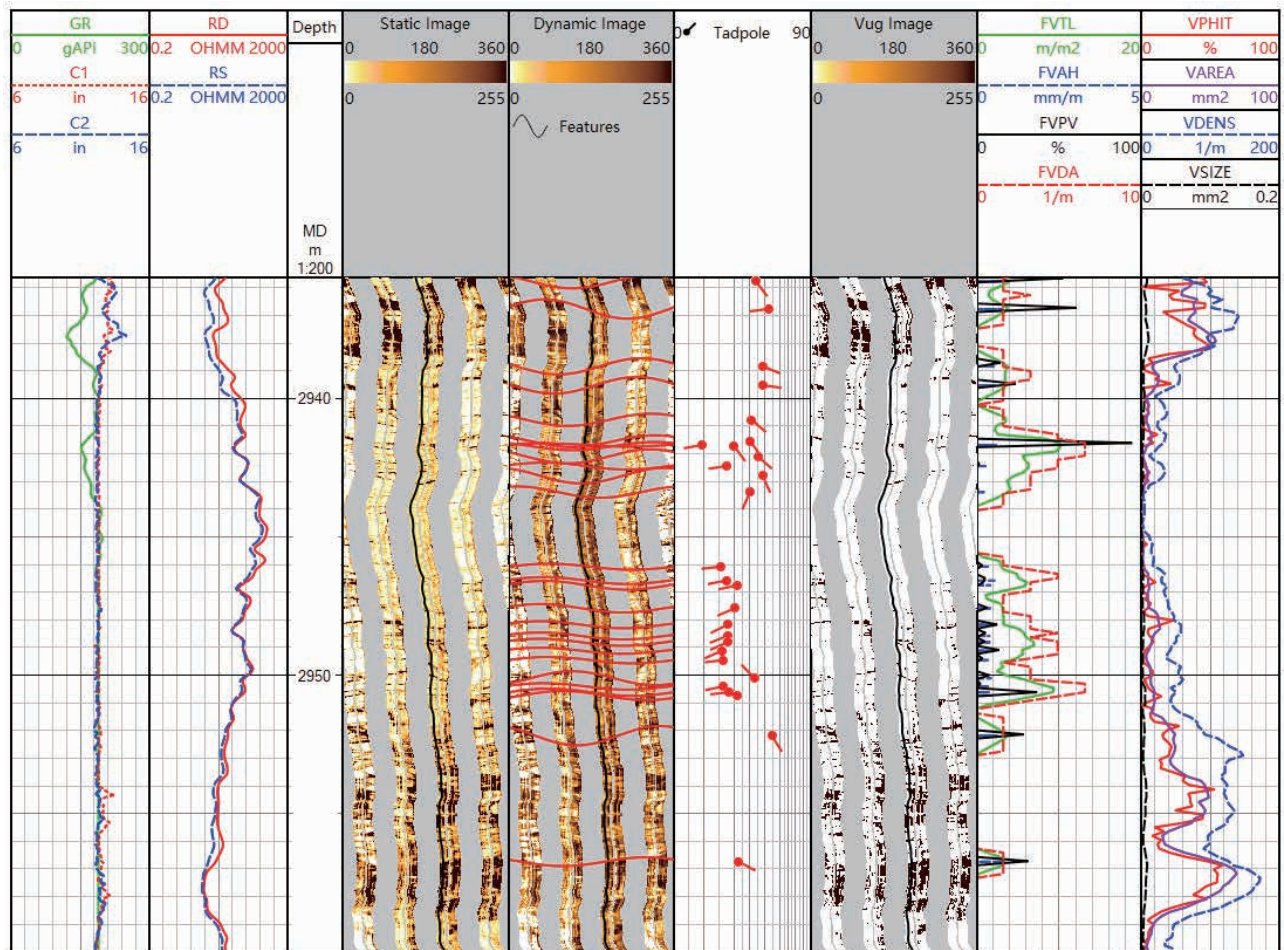
The images are sensitive to fine sedimentological changes and obvious tectonic features. The 0.2 in. resolution allows analysis down to the grain level in micro-conglomerates and coarser materials.

Large Borehole coverage provides information useful for understanding complex structures and removes uncertainties during the interpretation process. Multiple logging modes allow wellsite customization of results without compromising efficiency. Imaging applications include analysis of structures, characterization of sedimentary bodies and boundaries using sedimentary features, and evaluation of rock textures and fracture networks.



The major functions of Geology module are preprocessing, image enhancement, processing and analysis of imaging logging data. The software can conduct information extraction and interpretation for various geological events by using the automatic mode firstly and interactive mode latterly. Geology module can:

- Process multiple types of data and various data acquired by different imaging logging devices.
- Automatically extracts dips from Image data, identifies the underlying structure in dip sequences.
- Perform interactive interpretation and quantitative calculation for geological events around the well, such as fractures (regular fractures, net fractures and irregular fractures), pores, cavities, gravels, block masses, nodules etc.;

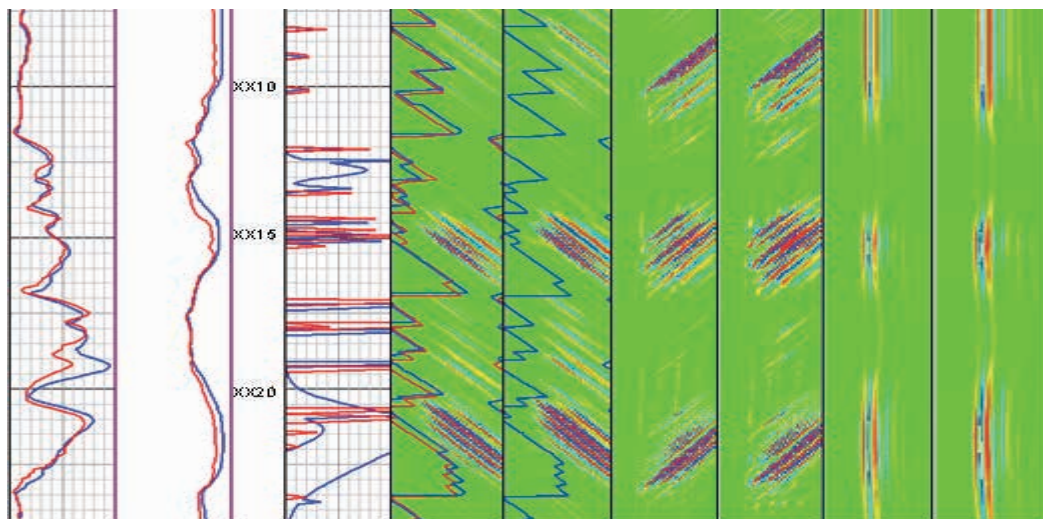


Sonic view can be used to process orthogonal multi-pole subarray acoustic logging data. This software system mainly comprises acoustic velocity analysis module, rock mechanics parameter calculation module and permeability calculation module.

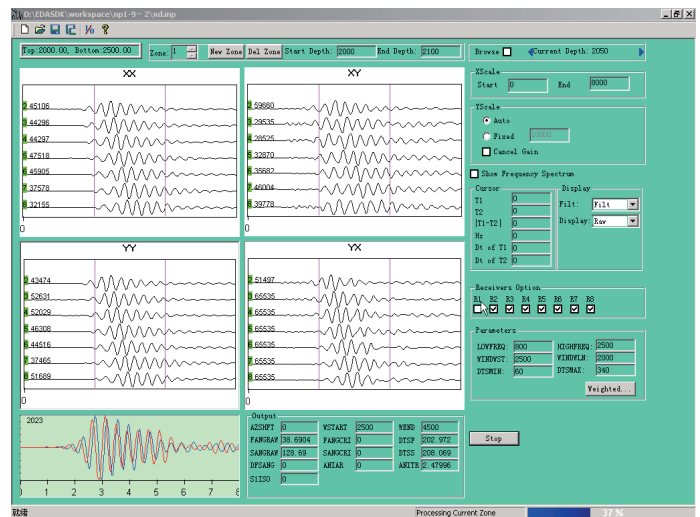
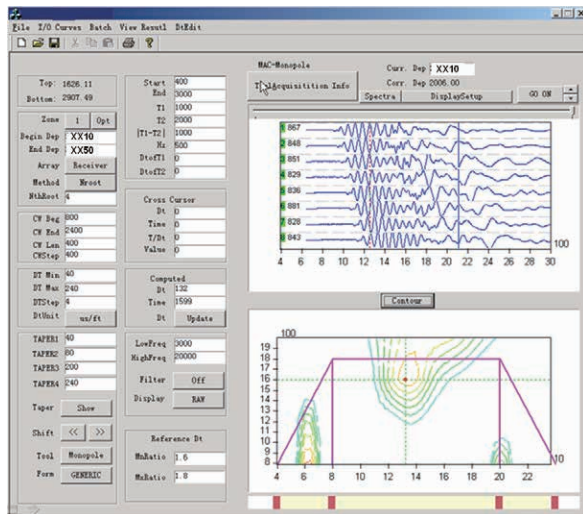
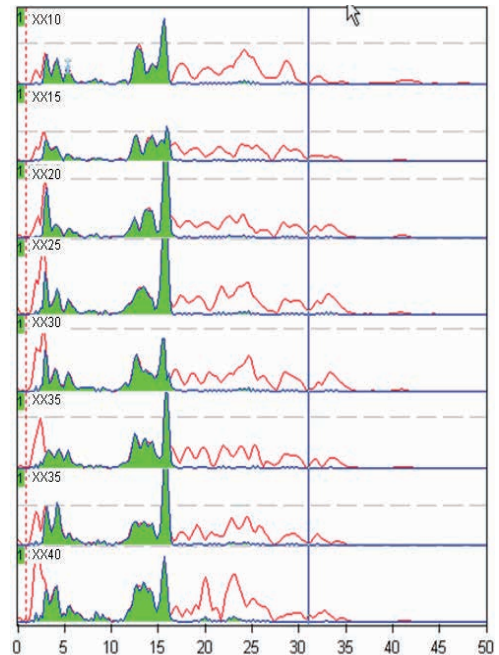
Acoustic velocity analysis module: adopt time difference-time correlation method to extract longitudinal wave, transversal wave, Stoneley wave time difference and arrival of each wave of formation; enhance the vertical resolution of acoustic time difference curve through multi-shotpoint processing method, carry out borehole compensation, and conduct frequency dispersion correction and extract time difference of dipole transversal wavelet by taking use of DSTC method. Calculate the acoustic attenuation coefficient of each longitudinal wave, transversal wave and Stoneley wave, etc. of the formation through full-wave waveform component wave filtering and frequency feature analysis.

Rock mechanics parameter calculation module: it is used to calculate rock mechanics characteristics parameters such as formation rock Poisson ratio, bulk modulus, young's modulus, Lamé coefficient, bulk compressibility and rock compressibility, etc., conduct earth stress and borehole wall rock stress analysis based on rock dynamic elastic parameters, calculate overburden pressure, formation pore fluid pressure, inherent shearing strength of rock, tensile strength, maximum horizontal principal stress, minimum horizontal principle stress, sand production index B, fracture pressure and maximum and minimum mud density window, etc. to provide reliable parameters for borehole stability analysis and well bore sand production prediction and analysis, etc.,

Permeability calculation module: it can be used to conduct separation of upcoming, downgoing, direct and reflected waves of Stoneley wave, adjudge formation permeability qualitatively and at the same time, calculate formation permeability curve quantitatively, thus providing reliable basis for formation evaluation.



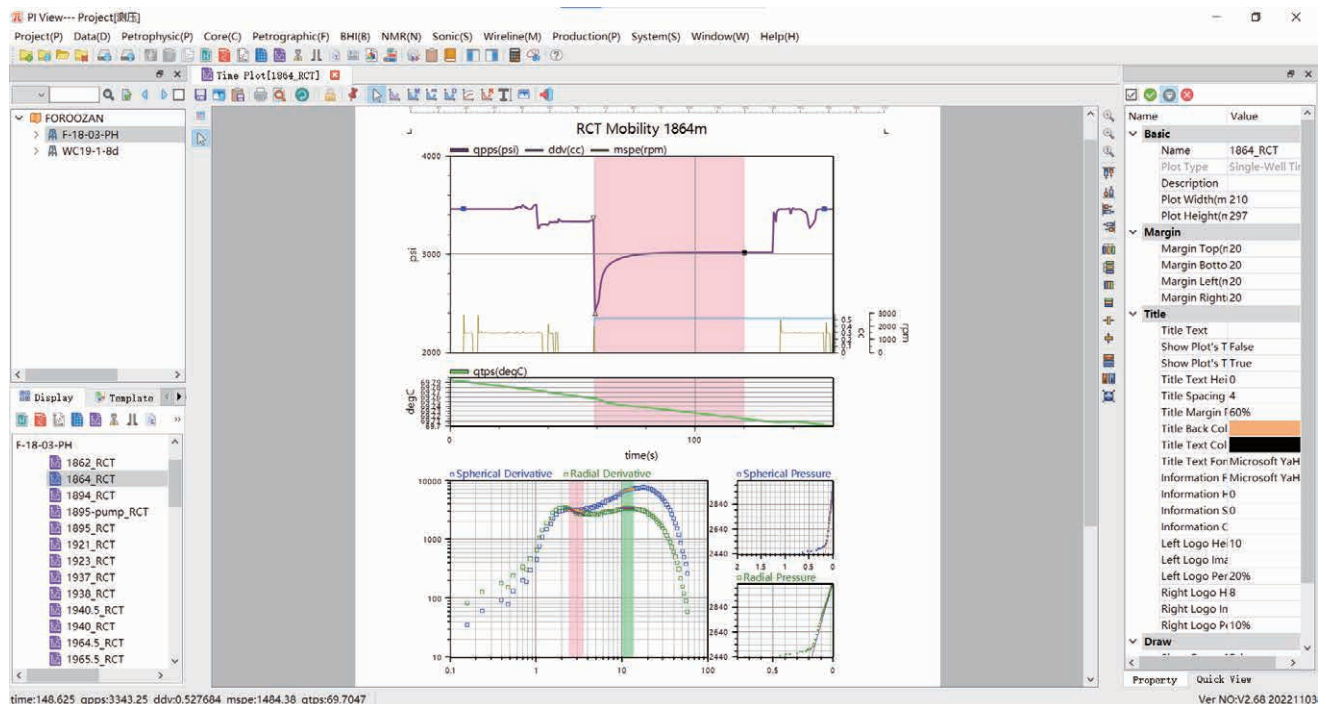
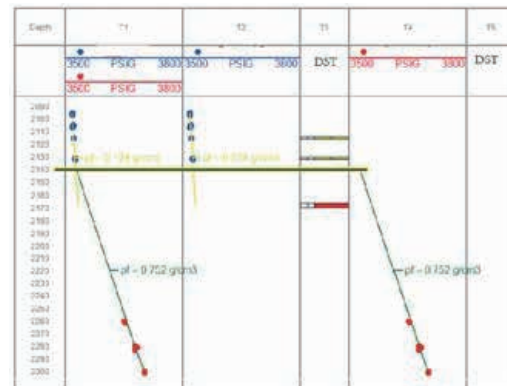
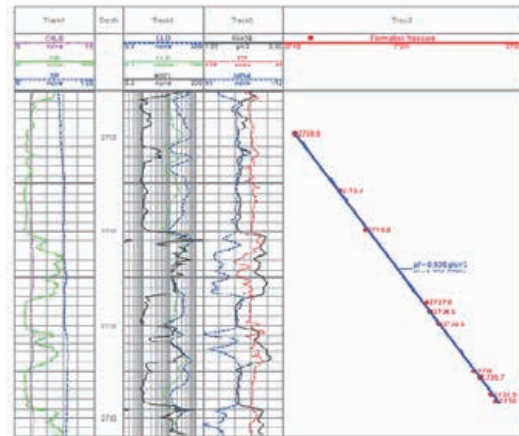
- Spectrum analysis, filtering and tracking wiggle. Velocity data analysis (including P-wave, S-wave, Stoneley wave).
- Amplitude and attenuation data analysis (including P-wave, S-wave, Stoneley wave): calculating elastic mechanics parameters, Poisson's ratio, Young modulus, shear modulus and volume elasticity constants.
- Wave field separation signals processing: separation of body waves from Stoneley waves and separation of direct Stoneley waves from reflected Stoneley waves.
- Permeability inversion.
- Anisotropy analysis.



Mobility analysis is module about reservoir flowability analysis.

The major modules of Mobility analysis include: analysis and processing of wireline formation testing data, analysis and processing of nuclear magnetic data of cores, analysis of capillary pressure curve and analysis and processing of drill-stem testing data.

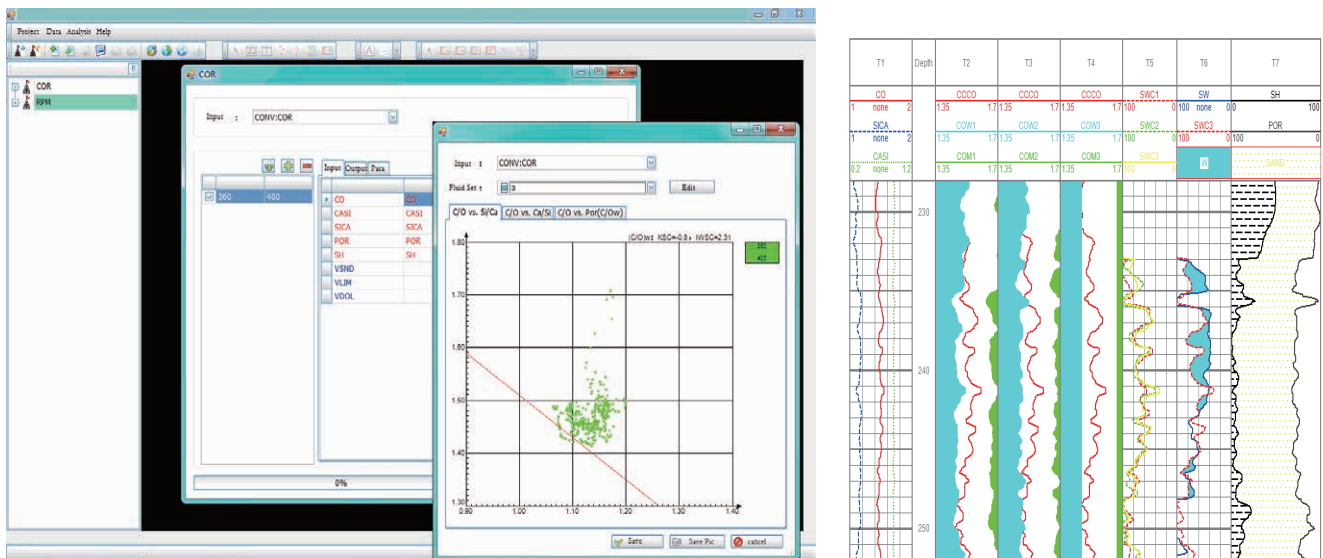
Its main functions include: pressure profile analysis and appraisal, calculation of reservoir permeability, calculation of fluid density, determination of fluid property and fluid interface, calculation of core permeability and bound water saturation by nuclear magnetic resonance analysis results of cores, calculation of oil and gas saturations by nuclear magnetic resonance data and capillary pressure data, and productivity prediction by formation testing data and wireline formation testing data.



Reservoir monitor module is a set of pulsed neutron spectral logging data processing software supporting processing and interpretation of carbon-oxygen (C/O) logging data and reservoir performance monitor logging data. The major modules of Neutron COR software include: C/O interpretation and processing program and reservoir monitor interpretation and processing program.

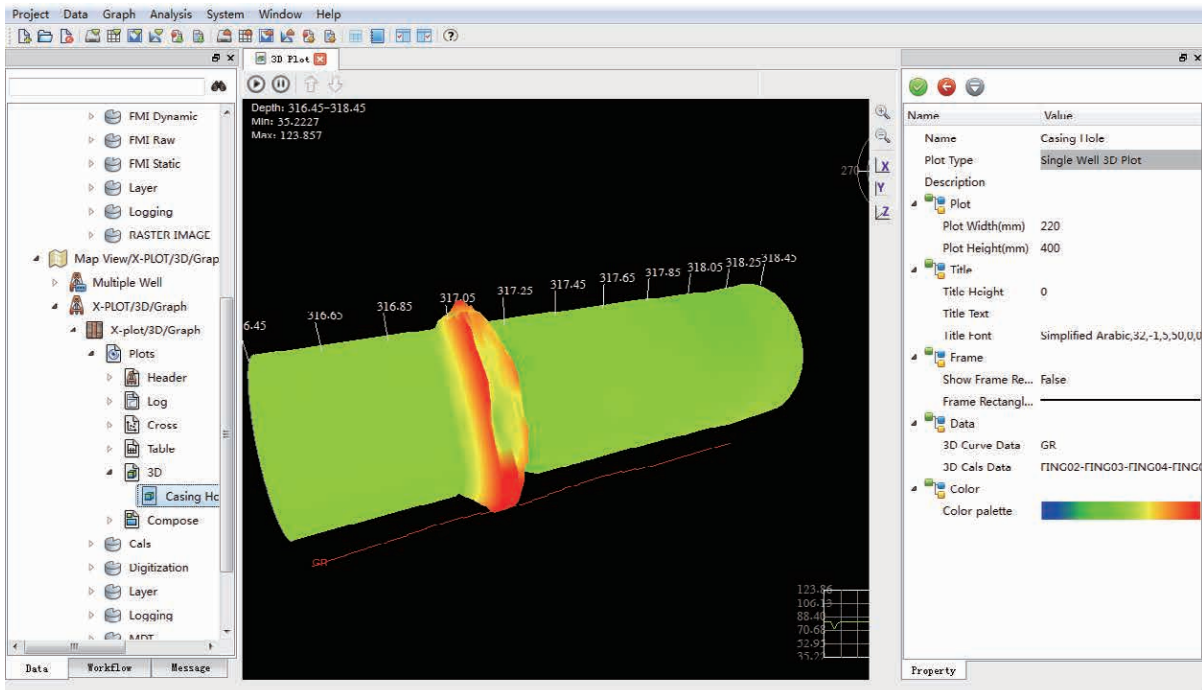
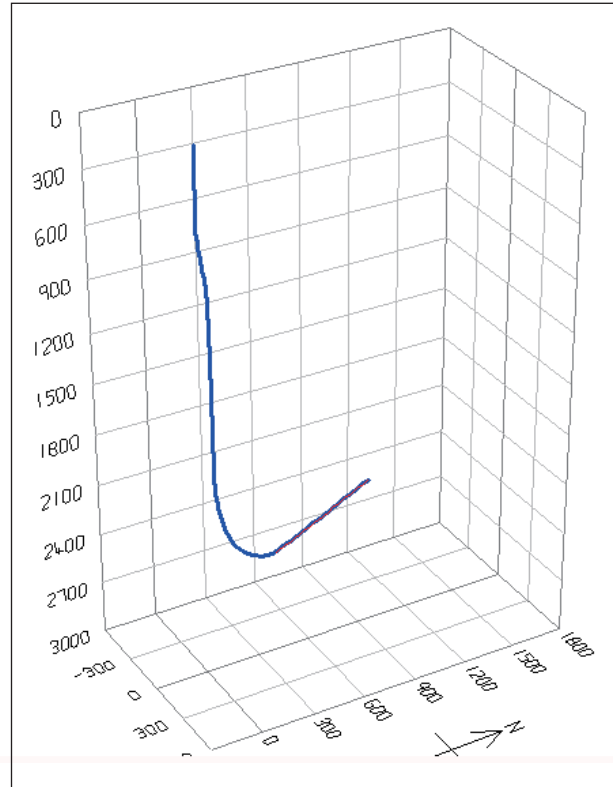
In C/O spectral logging, a pulsed neutron source is used to emit high energy fast neutron pulse with energy of 14MeV into formations to respectively measure the counting rate spectrums of energy distribution of gamma rays released by inelastic scattering occurred by the atomic nucleus in the formations and the fast neutrons and those released when thermal neutrons are captured by atomic nucleus, in which both the counting rate of inelastic scattering gamma rays and that of capture gamma rays are directly proportional to their corresponding neutron flux. Since the energies of inelastic scattering gamma rays and capture gamma rays generated by different atomic nucleus are different, various elements in the formations and their contents can be analyzed by recording the inelastic scattering gamma rays and capture gamma rays with different energies.

The formation properties can be studied and the remaining oil saturation of reservoir can be calculated by recording nearly 20 logging curves of formation, including C/O, Si/Ca, Ca/Si and H/Cl, based on the measurement results.



3D View module supports 3D graphics to display downhole information.

3D View display module include: casing damaged borehole imaging, cementing quality, caliper measurements, more features such as borehole trace, multi-well borehole trace, etc.

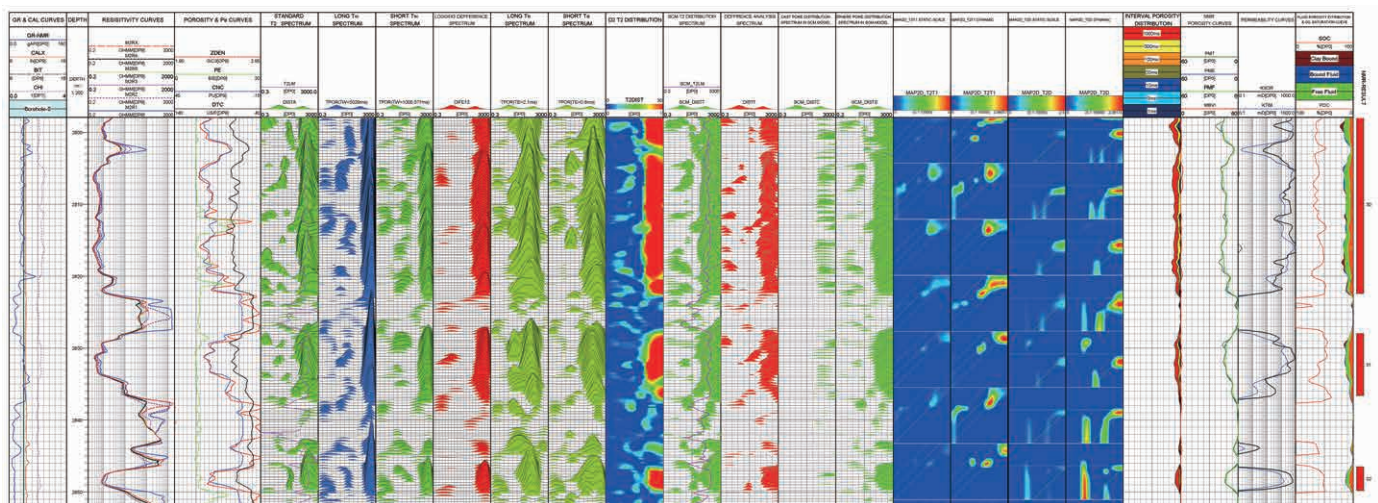
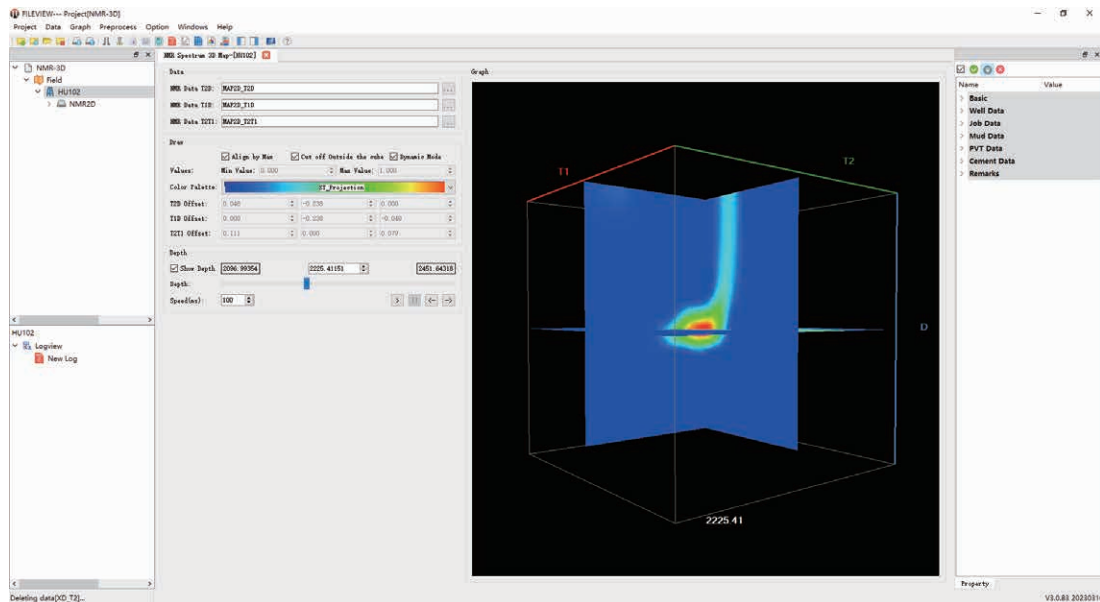


Nuclear magnetic resonance (NMR) interpretation is about data processing and T2, T1 relaxation time, and Diffusion interpretation. The T2, T1 and D three digital dimensional can show 1D, 2D plot, 3D demonstration and play back.

NMR data processing mainly include: Data Decomposing, Echo string generation, Time-Depth conversion, T2 spectrum inversion, etc.

NMR data interpretation mainly include: T2 distribution, T2 cut-off, Porosity calculation model, Permeability model, T2 differential spectrum method, T2 shift spectrum method, etc. Final output of reservoir information such as total porosity, effective porosity, T2 distribution, pore fluid identification, bound water volume, total water/oil/gas volume and Water saturation, etc.

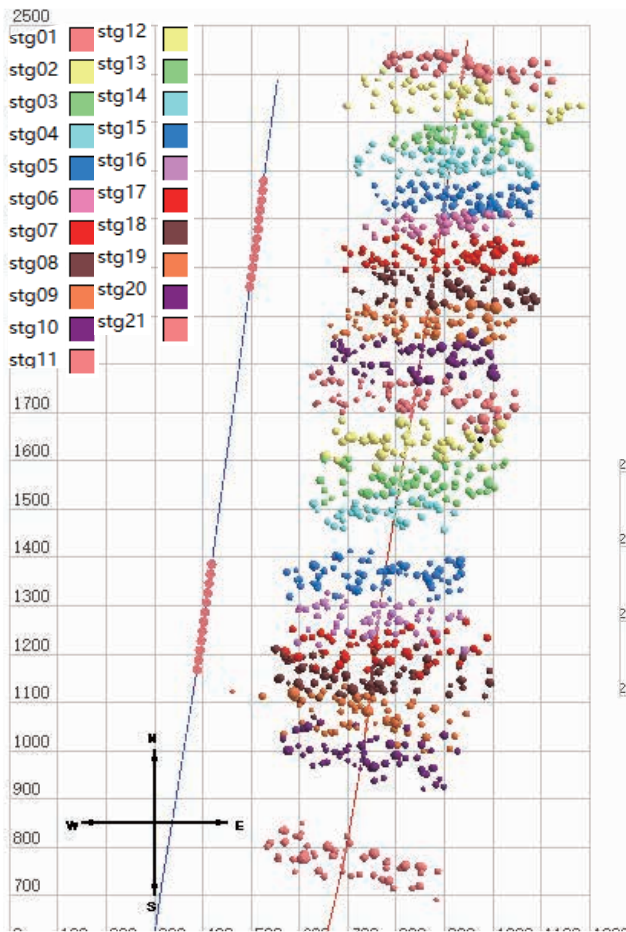
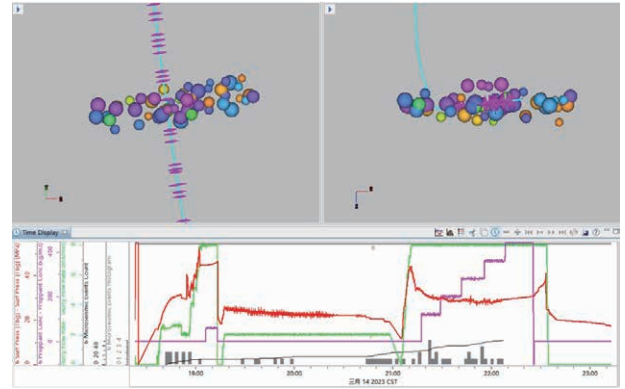
2D interpretation solves the problem of overlapping T2 spectrum when oil, gas, and water coexist in the pores of the formation, beneficial for identifying and quantitatively evaluating oil, gas and water.



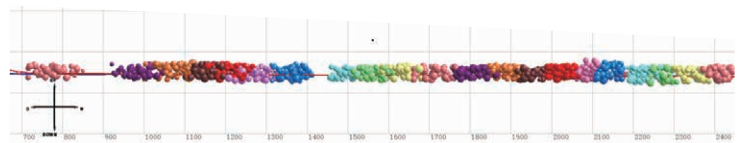


Microseismic data processing mainly include: receiver orientation, establishing velocity model, event location, event magnitude estimation, B-value estimator, renovation volume calculation, real time interpretation etc.

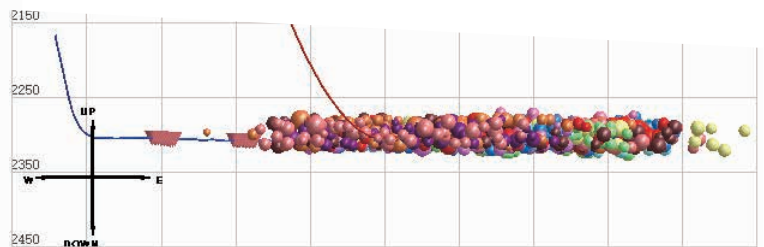
Microseismic data interpretation mainly include: analyze spatial distribution characteristics of fracturing fracture network, include information such as orientation, length, height, width, and renovation volume. Describe the process of fracture development and evaluate the fracturing effect, according to pressure, displacement, sand addition curve to evaluate the impact of various parameter changes on fracture formation, provide a basis for improving the fracturing process, and guide the design of the fracturing plan for the next well in the area.



Top view



Front view (north to south)



Front view (south to north)



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