

测井解释功能介绍

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GeoFrac



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测井解释工作涉及大量复杂的测井曲线计算，GeoEast软件提供了专业且灵活的曲线计算功能。

曲线自定义计算功能允许测井解释人员按照一定规则自定义计算表达式，把输入测井曲线通过自定义的表达式进行运算、组合、转换，最终生成符合特定解释需求的新曲线。

测井曲线自定义计算

1

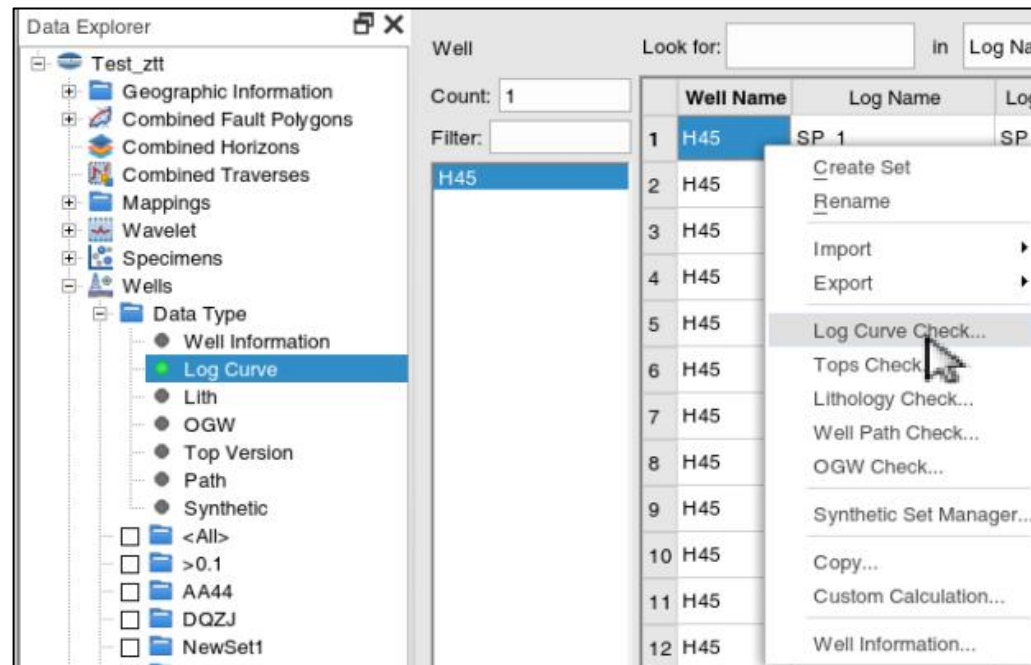
GeoRock模块→ User Define Calculation

2

Tools模块→ Calculation

3

主控→ Well → Data Type → Log Curve → 选中曲线右击选择Log Curve Check

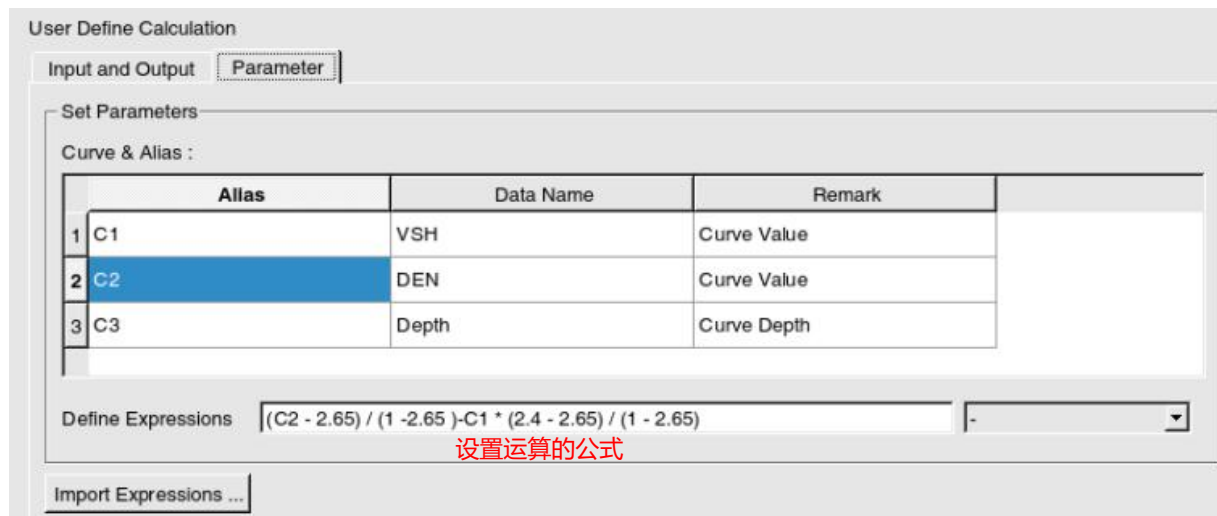
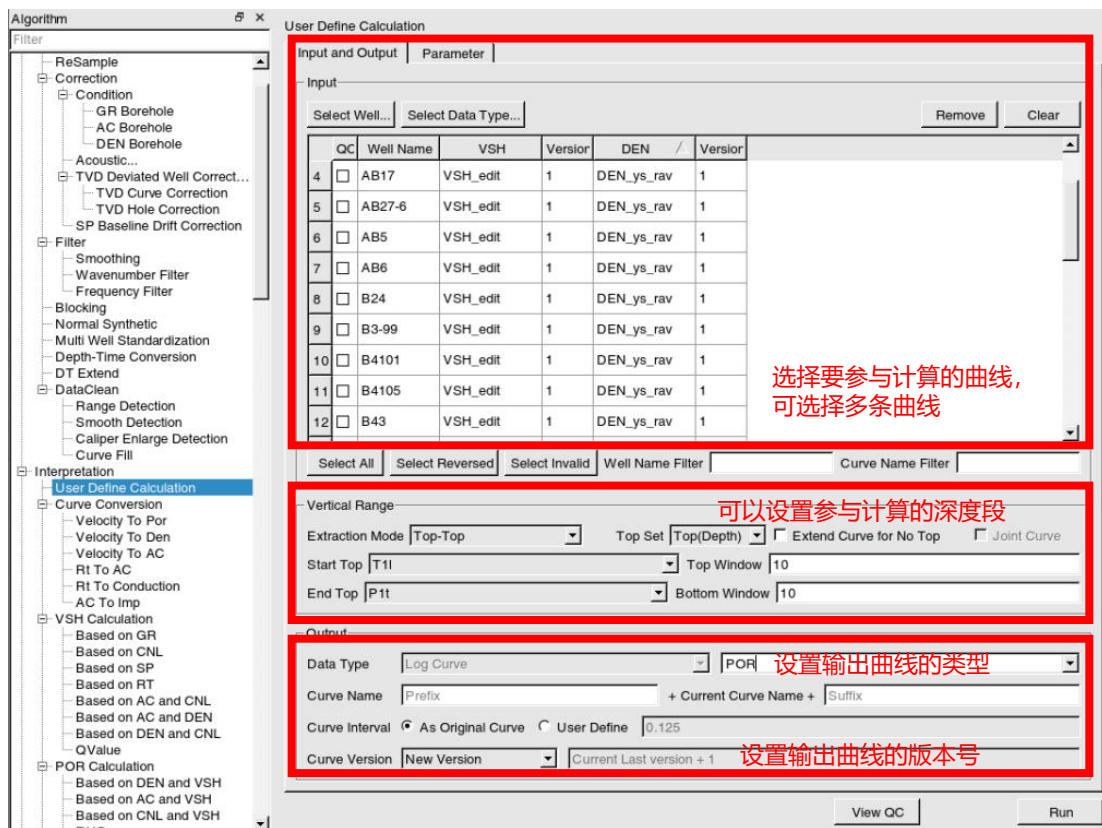




1、GeoRock模块→ Calculation

在方法列表中选择Interpretation->UserDefineCalculation，切换到曲线自定义计算。

支持复杂函数运算，支持多曲线组合运算，支持利用地质分层设置参与计算的曲线深度段。





曲线计算



2、Tools模块→ well logs 支持复杂函数运算，支持多曲线组合运算，可以利用if语句进行有条件的计算。

Expressions Calculator

Type: well log Survey: []

Set Input & Output Data ... (选择输入与输出数据设置, 弹出图2)

Data & Alias:

	Alias	Remark
1	C1	Data of Curve 1 column in table of <i>Wells & Curves</i> within the windows of <i>Set Input & Output Well Log Curve Data</i>
2	C2	Data of Curve 2 column in table of <i>Wells & Curves</i> within the windows of <i>Set Input & Output Well Log Curve Data</i>

Public Parameters:

Input Curves Count: 2

Result Name: POR_cal

Result Remark: Nature: Log Curve, Curve Type: POR, Version: auto set

Define Expressions:

Type	Expressions
1	if C2 != 100
2	y = (C1 - 2.65) / (1 - 2.65) - C2 * (2.4 - 2.65) / (1 - 2.65)
3	else y = 0.001

Signs & Functions:

Import Expressions ... Null Value Flag of Result: Y_NULL= -9999

Save Expressions []

Thread Number 8 (1 ~ 16)

OK Apply Cancel Help

Set Input & Output Well Log Curve Data

Well Set: well_log

选择参与计算的曲线条数

Wells & Curves

Well	Curve 1	Curve 2	Start Z	End Z	Validity
1 AB17	DEN_ys_rav(V1)	VSH_edit(V1)	3541	4313.5	OK
2 AB27-1	DEN_ys_rav(V1)	VSH_edit(V1)	3622	4399.38	OK
3 AB27-6	DEN_ys_rav(V1)	VSH_edit(V1)	3351	4022.62	OK
4 AB5	DEN_ys_rav(V1)	VSH_edit(V1)	3531	4218.12	OK
5 AB6	DEN_ys_rav(V1)	VSH_edit(V1)	3319	4014.88	OK
6 B2-105	DEN_ys_rav(V1)	VSH_edit(V1)	3542	4315.88	OK
7 B24	DEN_ys_rav(V1)	VSH_edit(V1)	3501.38	4267	OK
8 B3-96	DEN_ys_rav(V1)	VSH_edit(V1)	3619	4331.88	OK
9 B3-99	DEN_ys_rav(V1)	VSH_edit(V1)	1081	4469.88	OK
10 B4101	DEN_ys_rav(V1)	VSH_edit(V1)	3611.88	4345.88	OK

Filter: []

Output Data:

Name: POR_cal Resampling Interval of Selected Curves in Individual Well: User Define 0.125

Nature: Log Curve Curve Type: POR Version: auto set

OK Cancel

Set Well Log Data

Setting for Well **AB17**, Curve **1**

Available Curve List

Curve Type Filter: DEN **选择参与计算的曲线**

Name	Type	Source	Version	Domain	Start	End	Interval	Sampling Number	D/V
1 DEN_ai_std	DEN	standard	1	Depth	3581.75	4209.88	0.125	5026	Measure
2 DEN_ai	DEN	AI Prediction	1	Depth	3581.75	4209.88	0.125	5026	Measure
3 DEN_ys	DEN	Original	1	Depth	3541	4318.5	0.125	6221	Measure
4 DEN_ys_rav	DEN	Curve CalEnlarge detection	1	Depth	3541	4318.5	0.125	6221	Measure
5 DEN_11111	DEN	SYN	1	Depth	1309.11	4316.61	0.125	24061	Vertical
6 DEN_test_1224	DEN	SYN	1	Depth	1309.11	4316.61	0.125	24061	Vertical
7 DEN_1225	DEN	SYN	1	Depth	1309.11	4316.61	0.125	24061	Vertical
8 DEN_Xuwhite	DEN	XuWhite	1	Depth	3581.75	4209.88	0.125	5026	Measure

Selected Curve

Name	Type	Source	Version	Domain	Start	End	Interval	Sampling Number	D/V	
Curve 1	DEN_ys_rav	DEN	Curve CalEnlarge detection	1	Depth	3541	4318.5	0.125	6221	Mea

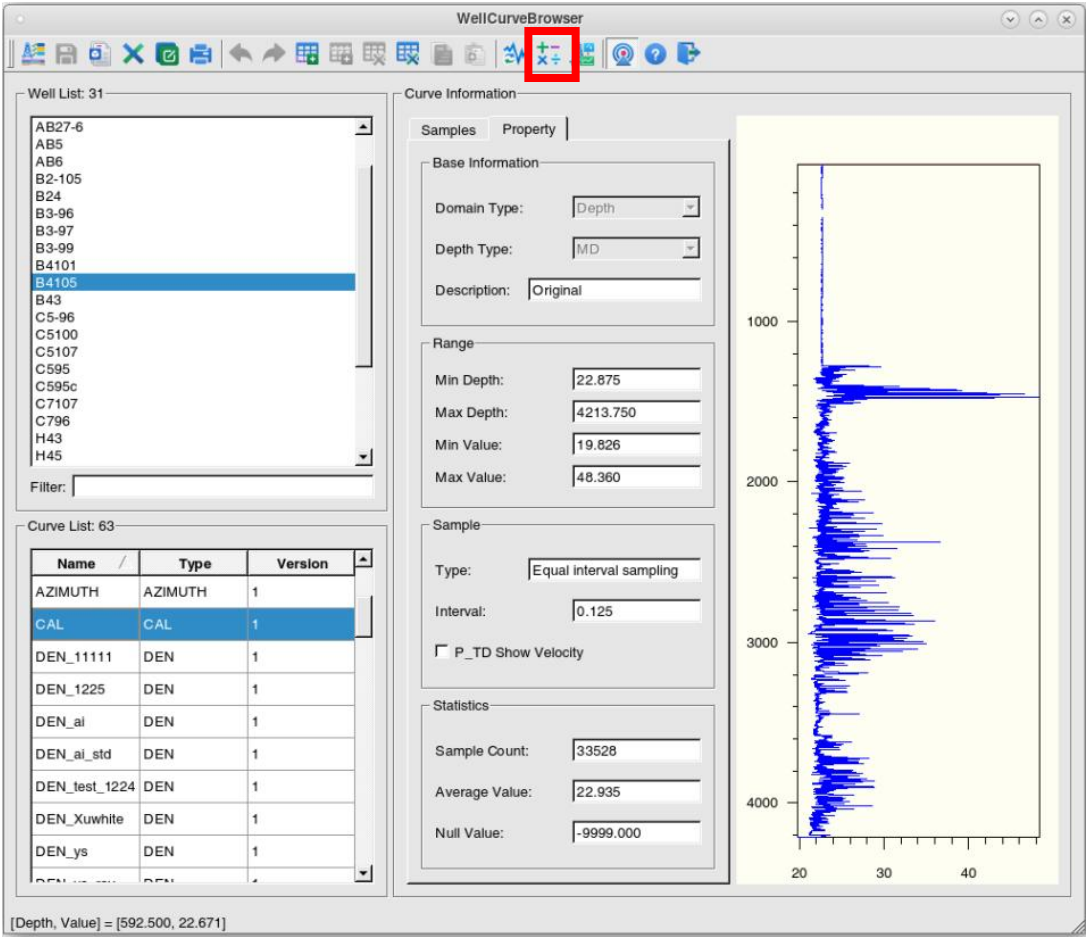
将设置应用到所有曲线

Apply Curve 1 Curve(s) to All Well(s) Close



3、主控→ Log Curve Check

可以进行单条曲线的简单加减乘除运算，进行曲线复制，单位转换。



Curve Transformation

Transformation parameter

Input Curve

Name: CAL

Type: CAL

Version: 1

Output Curve

Name: CAL_tf

Type: CAL

Version: New Max Version

Formula

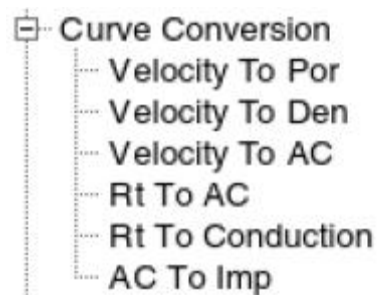
New Depth = ((Depth + 0.000) * 1.000 - 0.000) / 1.000

New Value = ((Value + 0.000) * 1.000 - 0.000) / 1.000

OK Cancel



曲线转换: GeoRock提供曲线快速转换工具, 实现速度与声波时差、速度与密度、电阻率与声波时差、声波时差与阻抗等常用曲线的快速转换



1) Velocity to POR

$$por = 100 * \left(\frac{velo - velo_{matrix}}{velo_{fluid} - velo_{matrix}} \right)$$

2) Velocity to DEN

$$DEN = 0.31 * velo^{0.25}$$

3) Velocity to AC

$$AC = \frac{1.0 * 10^6}{velo}$$

4) RT to AC

$$AC = \frac{10^3}{(Rt * depth)^{\frac{1}{6}}}$$

5) RT to Condition

$$Cond = \frac{1000.0}{Rt}$$

6) AC to Imp

$$IMP = DEN * Velo \quad Velo = \frac{1.0 * 10^6}{AC} \quad DEN = 0.31 * Velo^{0.25}$$

Velocity To Por

Input and Output | Parameter

Set Parameter

Matrix Velo m/s

Liquid Velo m/s

AC To Imp

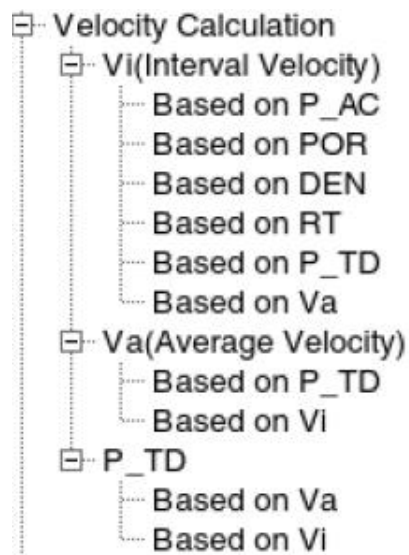
Input and Output | Parameter

Set Parameter

☒ AC to DEN ☐ Original DEN



速度转换: GeoRock提供声波时差、速度、密度、电阻率等转换成层速度，层速度、平均速度与时深关系间的相互转换功能。



1) 基于P_AC的层速度计算

$$Vi = \frac{1.0 * 10^6}{AC}$$

2) 基于POR的层速度计算

$$Vi = por * velo_{fluid} + (1 - por) * velo_{matrix}$$

3) 基于DEN的层速度计算

$$Vi = \left(\frac{Den}{0.31} \right)^4$$

4) 基于RT的层速度计算

$$Vi = 1000 * (Rt * depth)^{\frac{1}{6}}$$

5) 基于P_TD的层速度计算

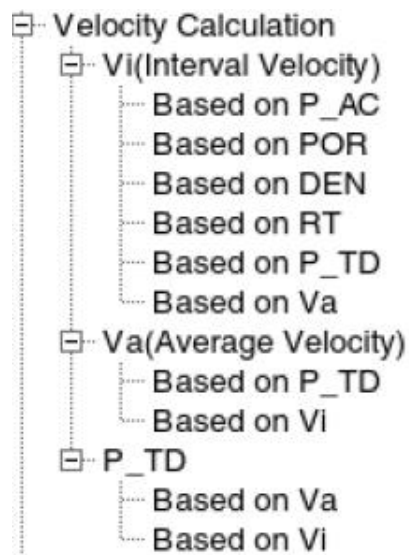
$$Vi = \frac{2000 * (depth[i] - depth[i - 1])}{time[i] - time[i - 1]}$$

6) 基于平均速度的层速度计算

$$Vi = \frac{(depth[i] - depth[i - 1])}{\frac{(depth[i] + \Delta depth)}{Va[i]} - \frac{(depth[i] + \Delta depth)}{Va[i]}}$$



速度转换: GeoRock提供声波时差、速度、密度、电阻率等转换成层速度，层速度、平均速度与时深关系间的相互转换功能。



1) 基于P_TD的平均速度计算

$$Va = \frac{2000 * depth[i]}{time[i]}$$

2) 基于层速度的平均速度计算

$$Va = \frac{depth[i] + \Delta depth}{time[i - 1] + \Delta time}$$

$$\Delta time = \frac{(depth[i] - depth[i - 1])}{Vi[i]}$$

3) 基于平均速度的P_TD计算

$$time = \frac{2000 * (depth[i] + \Delta depth)}{Va[i]}$$

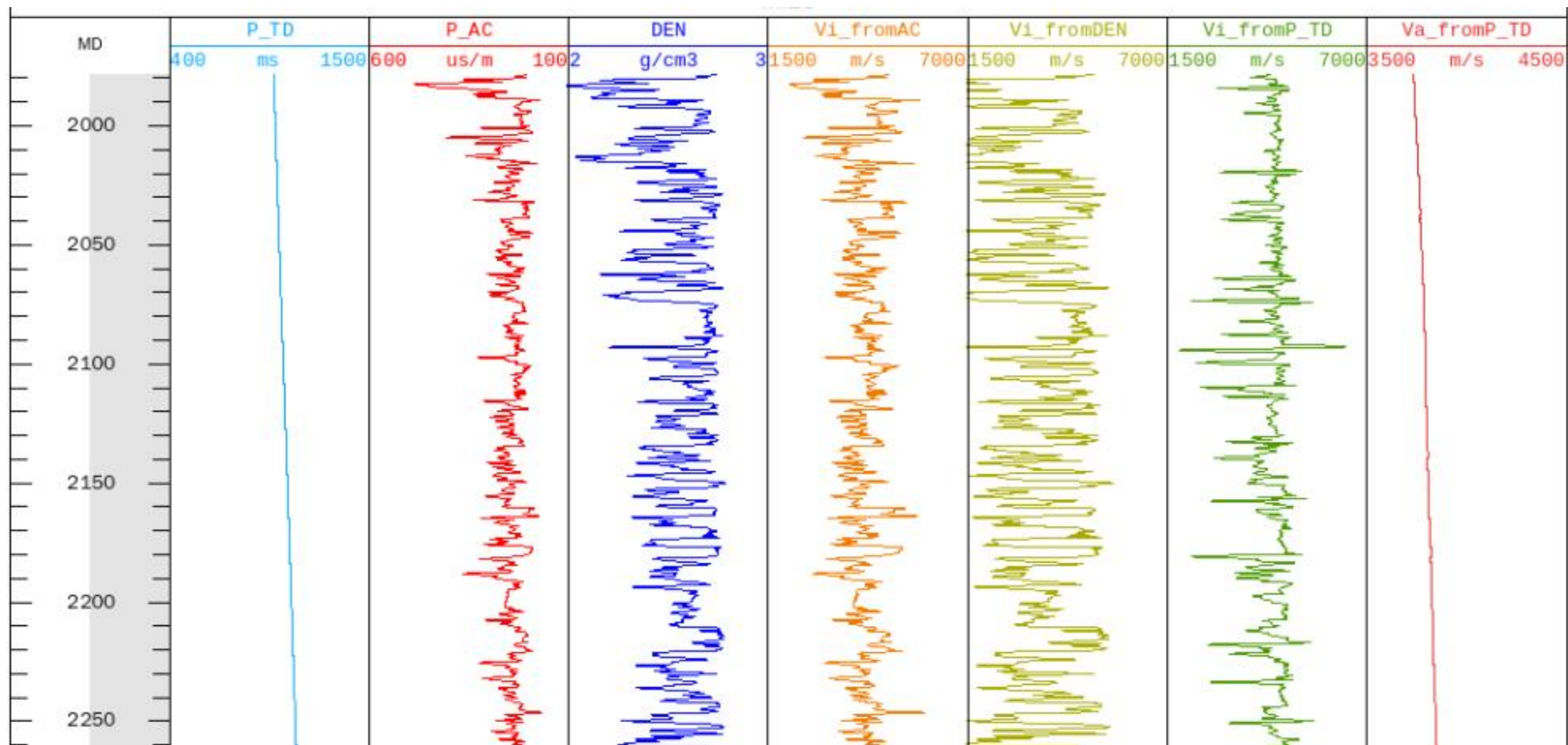
4) 基于层速度的P_TD计算

$$time = time[i - 1] + \Delta time$$

$$\Delta time = \frac{(depth[i] - depth[i - 1])}{Vi[i]}$$



速度转换



速度转换实例



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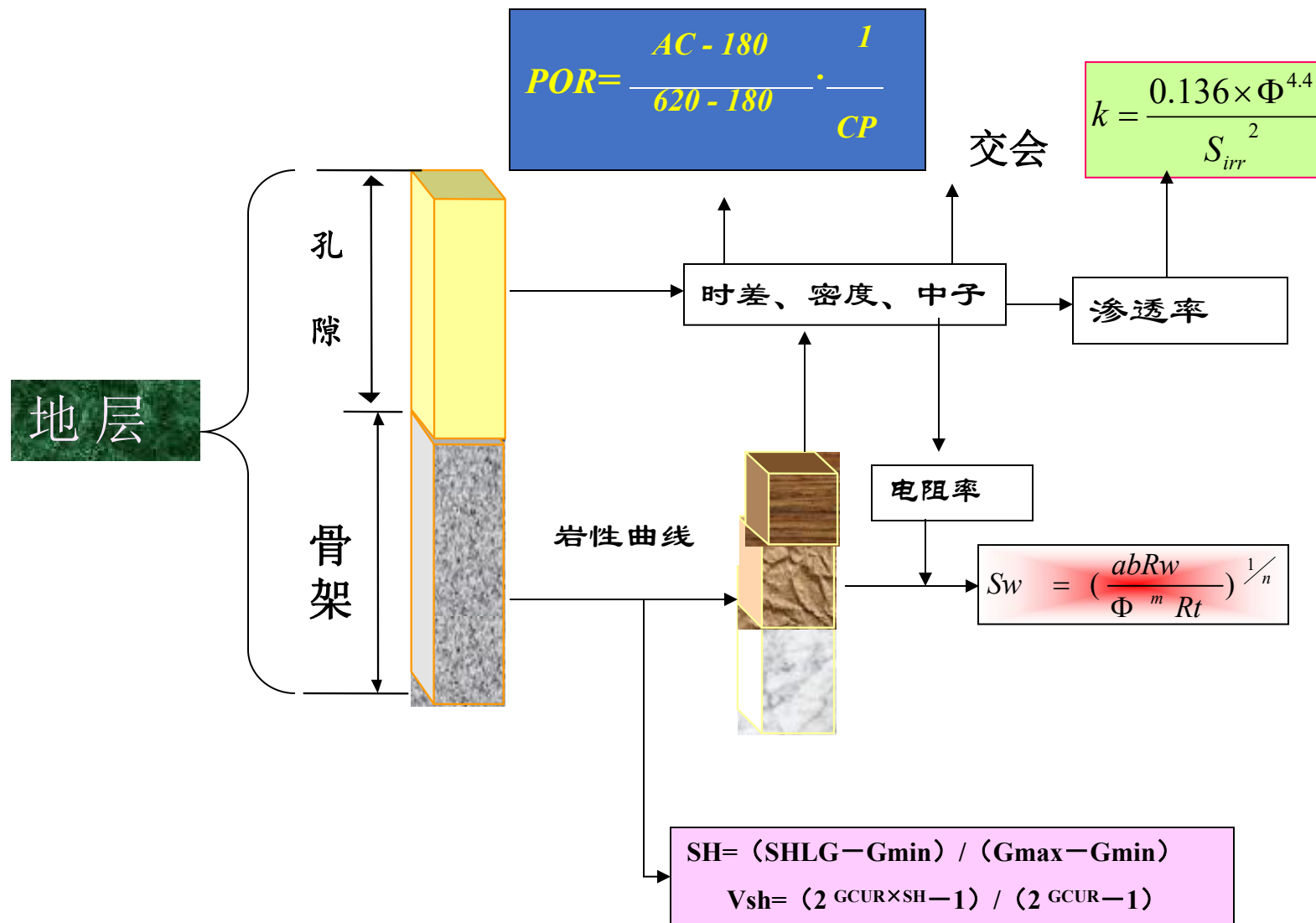
测井曲线计算功能

02

测井解释

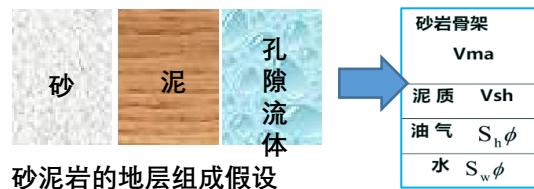
03

测井相关工具





基础解释：根据经验公式计算储层的泥质含量、孔隙度、饱和度、地层温度等基础信息，适用于简单地层，为后续岩石物理建模和分析提供基础参数。



泥质含量预测：

单曲线预测泥质含量常用的是相对值指示法。理论依据是测井曲线相对值的变化反映了泥质含量的变化，即随泥质含量的增大，测井曲线的值也会发生变化。

一般会根据地区敏感曲线的不同，选择利用自然伽马、中子、电阻率及自然电位计算泥质含量。

$$SH = \frac{GR - GR_{min}}{GR_{max} - GR_{min}}$$

$$Vsh = (2^{GCUR \times SH} - 1) / (2^{GCUR} - 1)$$

- VSH Calculation
 - Based on GR
 - Based on CNL
 - Based on SP
 - Based on RT
 - Based on AC and CNL
 - Based on AC and DEN
 - Based on DEN and CNL
 - QValue
- POR Calculation
 - Based on DEN and VSH
 - Based on AC and VSH
 - Based on CNL and VSH
 - RHG
 - Fracture POR
- SW Calculation
 - Arch
 - Hard Rock
 - Fertl
 - Simandoux
 - Indonesian
- TEMP Calculation
 - Gradient

Parameters

GR Value

☒ Auto ☐ User Defined

Sand Shale API

C

地层系数。老地层缺省为2.0，新地层缺省值为3.7。



泥质含量计算：不同岩性具有不同的测井曲线响应范围，以DEN和CNL计算泥质含量为例说明，泥质砂岩储层在中子—密度交会图上居于泥质点与纯砂岩线之间(无其他因素影响条件下)，泥质含量的大小由其距纯砂岩线的距离决定。



砂泥岩的地层组成假设

砂岩骨架	V_{ma}
泥质	V_{sh}
油气	$S_h \phi$
水	$S_w \phi$

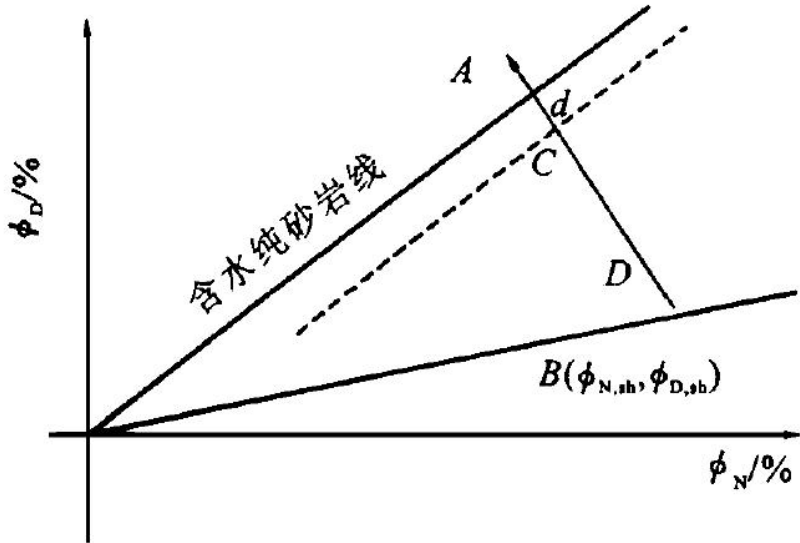
$$V_{ma} + V_{sh} + \phi = 1$$

$$DEN = V_{ma} \cdot DM + V_{sh} \cdot DSH + \phi \cdot DF$$

$$CNL = V_{ma} \cdot 0 + V_{sh} \cdot NSH + \phi \cdot NF$$

$$V_{sh} = \frac{(DEN - DF) \cdot (-NF) - (CNL - NF) \cdot (DM - DF)}{(DSH - DF) \cdot (-NF) - (NSH - NF) \cdot (DM - DF)}$$

- VSH Calculation
 - Based on GR
 - Based on CNL
 - Based on SP
 - Based on RT
 - Based on AC and CNL
 - Based on AC and DEN
 - Based on DEN and CNL
- QValue
- POR Calculation
 - Based on DEN and VSH
 - Based on AC and VSH
 - Based on CNL and VSH
- RHG
- Fracture POR
- SW Calculation
 - Arch
 - Hard Rock
 - Fertl
 - Simandoux
 - Indonesian
- TEMP Calculation
 - Gradient



Based on DEN and CNL

Input and Output | Parameter

Set Parameters

DEN Value

Matrix (g/cm³) Liquid (g/cm³) Shale (g/cm³)

CNL Value

Liquid (%) Shale (%)

Dialog

Load

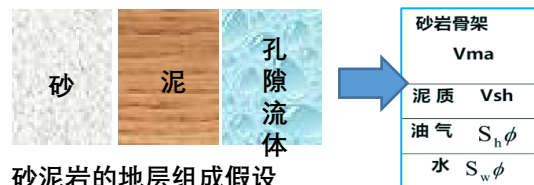
	Mineral	Vp (m/s)	Vs (m/s)	K (GPa)	Mu (GPa)	Rho (g/cm³)
1	Quartz	6037.62	4120.82	36.60	45.00	2.65
2	Wet Clay	2568.22	1129.87	11.50	3.00	2.35
3	Dry Clay	4304.92	2518.59	27.00	17.00	2.68
4	Calcite	6639.55	3436.29	76.80	32.00	2.71
5	Dolomite	7346.57	3959.73	94.90	45.00	2.87
6	Ankertie	6625.16	4062.45	62.60	47.20	2.86



孔隙度计算：岩石各部分相对体积之和为1。针对含水泥质砂岩： $V_{ma} + V_{sh} + \varphi = 1$

测井参数（岩石体积密度、含氢指数、声波时差）等于岩石各部分的相对体积与相应的物理参数乘积之和。

$$V_{ma} * \rho_{ma} + V_{sh} * \rho_{sh} + \varphi * \rho_f = 1$$



基于泥质校正后的密度孔隙度计算公式

$$POR = \frac{DEN - DMA}{DF - DMA} - VSH \times \frac{DSH - DMA}{DF - DMA}$$

DEN: 密度测井值 (g/cm^3)

DMA: 岩石骨架密度 (如砂岩取 $2.65 g/cm^3$)

DF: 地层流体密度 (淡水取 $1.0 g/cm^3$)

DSH: 纯泥岩密度 (通常取 $2.2 \sim 2.5 g/cm^3$)

VSH: 泥质含量 (小数, $0 \sim 1$)

- VSH Calculation
 - Based on GR
 - Based on CNL
 - Based on SP
 - Based on RT
 - Based on AC and CNL
 - Based on AC and DEN
 - Based on DEN and CNL
 - QValue
- POR Calculation
 - Based on DEN and VSH
 - Based on AC and VSH
 - Based on CNL and VSH
 - RHG
 - Fracture POR
- SW Calculation
 - Arch
 - Hard Rock
 - Fertl
 - Simandoux
 - Indonesian
- TEMP Calculation
 - Gradient

Based on DEN and VSH

Input and Output | Parameter

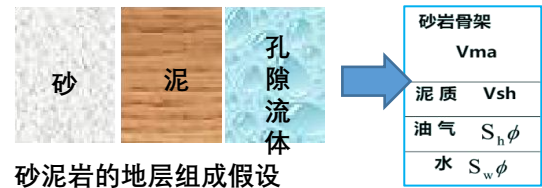
Set Parameters

DEN Value

Matrix (g/cm^3) Liquid (g/cm^3) Shale (g/cm^3)



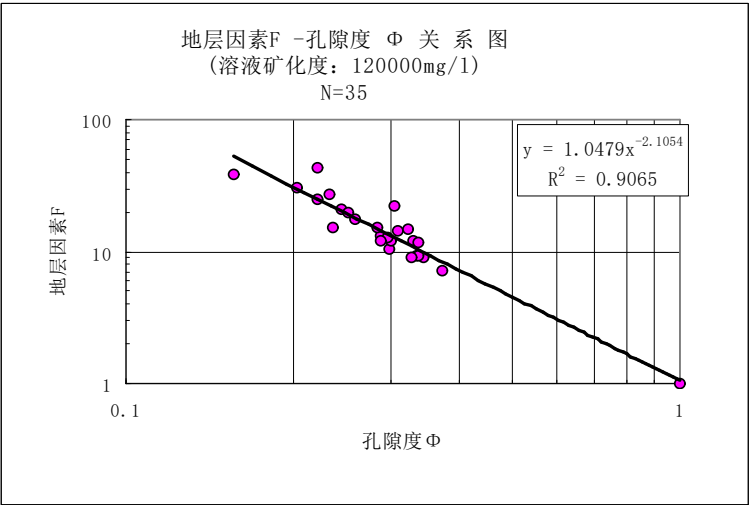
饱和度计算：通过测井数据评估储层岩石孔隙中油、气、水等流体所占体积百分比。通常认为电阻率曲线能够反映地层的含油气性。



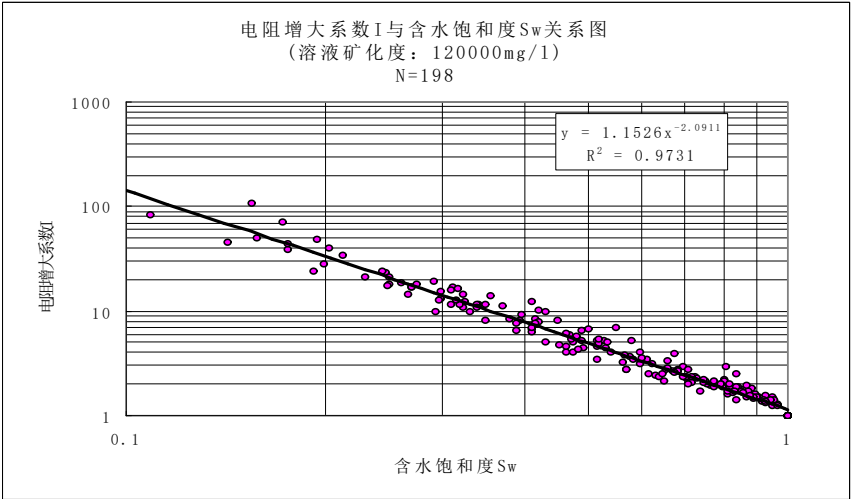
阿尔奇公式：

$$S_w = \left(\frac{a * b * R_w}{R_t * \phi^m} \right)^{1/n}$$

- VSH Calculation
 - Based on GR
 - Based on CNL
 - Based on SP
 - Based on RT
 - Based on AC and CNL
 - Based on AC and DEN
 - Based on DEN and CNL
 - QValue
- POR Calculation
 - Based on DEN and VSH
 - Based on AC and VSH
 - Based on CNL and VSH
 - RHG
 - Fracture POR
- SW Calculation**
 - Arch
 - Hard Rock
 - Fertl
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 - Indonesian
- TEMP Calculation
 - Gradient



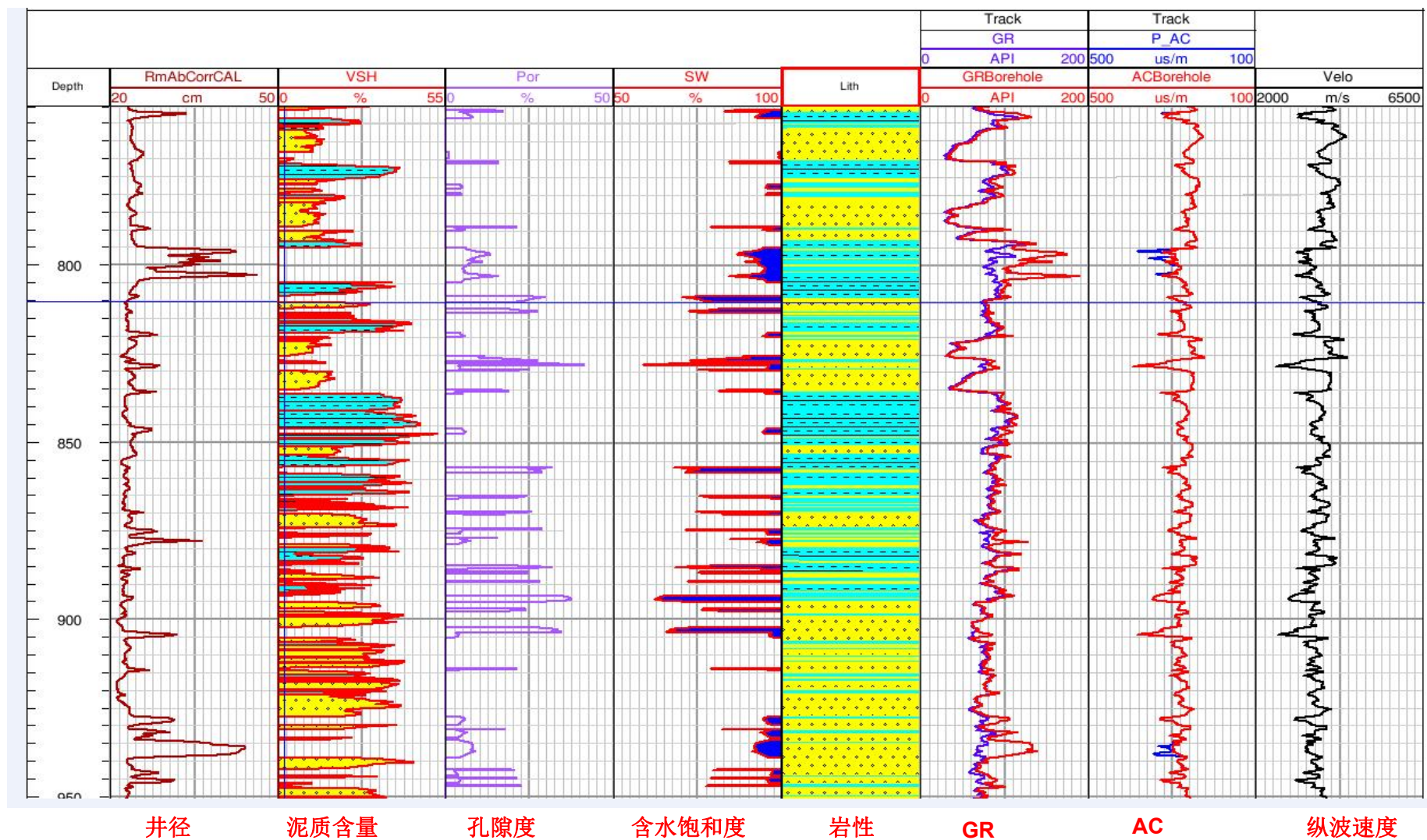
$$F = \frac{a}{\phi^m}$$



$$I = \frac{b}{S_w^n}$$

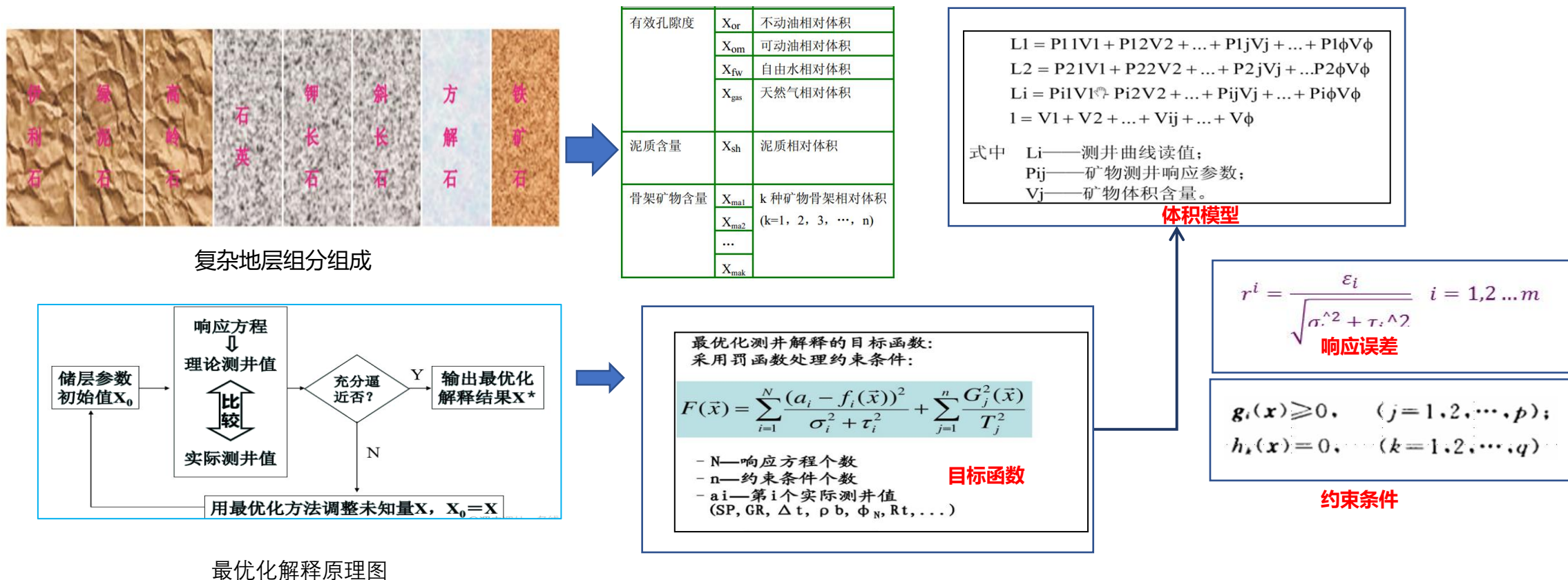


常规测井解释实例：





复杂地层矿物组分： 以各矿物组分的相对含量为自变量建立测井响应方程组，输入任意反映储层特性的测井曲线，采用最优化解释方法计算矿物体积含量、孔隙度和饱和度等测井参数解释，利用响应误差和约束条件提高测井解释合理性，通过重构测井响应与真实响应的一致性进行质控。





最优化测井解释充分利用测量信息，精确计算地层矿物组成和孔隙度，实现复杂储层矿物组分定量计算，满足岩石物理建模的计算需要。

Optimization

Input and OutputParameter

Parameter

Output component(v/v)

☒ Pore

☐ Dolomite

☐ Illite

☐ Anorthite

☐ White mica

☐ Mineral 1

☒ Clay

☐ Organic

☐ Kaolinite

☐ Albite

☐ Gas

☐ Mineral 2

☒ Quartz

☐ Pyrite

☐ Halite

☐ Gypsum

☐ Oil

☒ Calcite

☐ Siderite

☐ Potash feldspar

☐ Anhydrite

☐ Brine

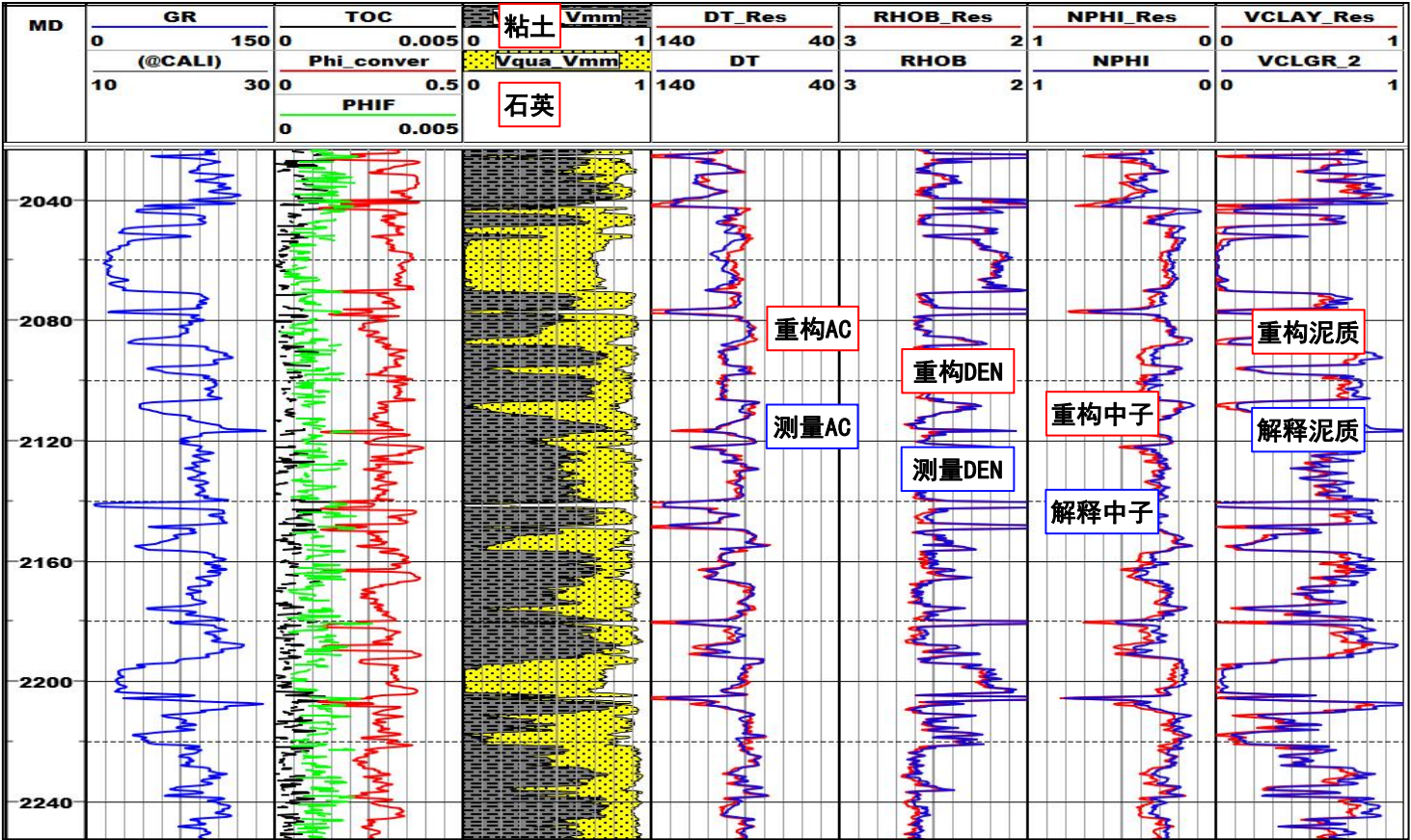
确定地层组成

Confirm component data

Responded Error

	Input Curve	Error	Pore	Clay	Quartz	Calcite
1	P_AC	3.28084	620.079	293.255	182.087	154.199
2	GR	10	1	1	1	11
3	DEN	0.03	1	2.6	2.65	2.71

来自地区和实验室信息





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基于岩性统计

基于岩性解释结论，如砂岩、泥岩、碳酸盐岩等，自动统计多井中不同岩性的厚度、层数、占比（如砂地比），优势岩性等结果。

Well Lithology

Input and Output | Parameter

Input

Select Well...

QC	Well Name	Lithology
1	☐ B24	Lith(OWG)
2	☐ B3-96	Lith(OWG)
3	☐ B3-97	Lith(OWG)
4	☐ B3-99	Lith(OWG)
5	☐ B4101	Lith(OWG)
6	☐ B4105	Lith(OWG)

选择要参与统计的井及井数据

Select All | Select Reversed | Select Invalid | Well Name Filter

Vertical Range 选择要参与统计的井层段

Extraction Mode Top-Top | Top Set Top(Deptl) | Extend Curve for No Top | Joint Curve

Start Top P2h8x | Top Window 0

End Top P1s2 | Bottom Window 0

View QC | Run

Well Lithology

Input and Output | Parameter

Select Lithology

Available 1

Silt sand

Selected 2

Data Name

Fine sand

Medium sand

选择要参与统计的岩性

Filter

Sortable | Save as Data Set

Statistic Information 统计模式，测深或垂深 阈值，厚度小于该数值的岩性段不参与统计

Mode MD | Threshold Value 0

Well Information 井信息统计

☒ Well Name ☒ X Coordinate(Well) ☒ Y Coordinate(Well) ☐ X Coordinate(Top) ☐ Y Coordinate(Top)

☐ Strata Thickness ☐ Start Depth ☐ End Depth ☐ KB

Lithology Information 岩性信息统计

☒ Total Thickness ☒ Total Percent ☒ Total Layers ☒ Advantage Lithology ☒ Lithology Loss Rate

☐ Single Lithology Information 单个岩性信息。勾选统计每种选择的岩性信息，信息内容与总岩性信息一致。

View QC | Run



测井统计



基于岩性统计

统计结果可以保存为散点或输出为ASCII文件，也可以点击 View Contours与平面成图子系统通讯，生成等值线数据。

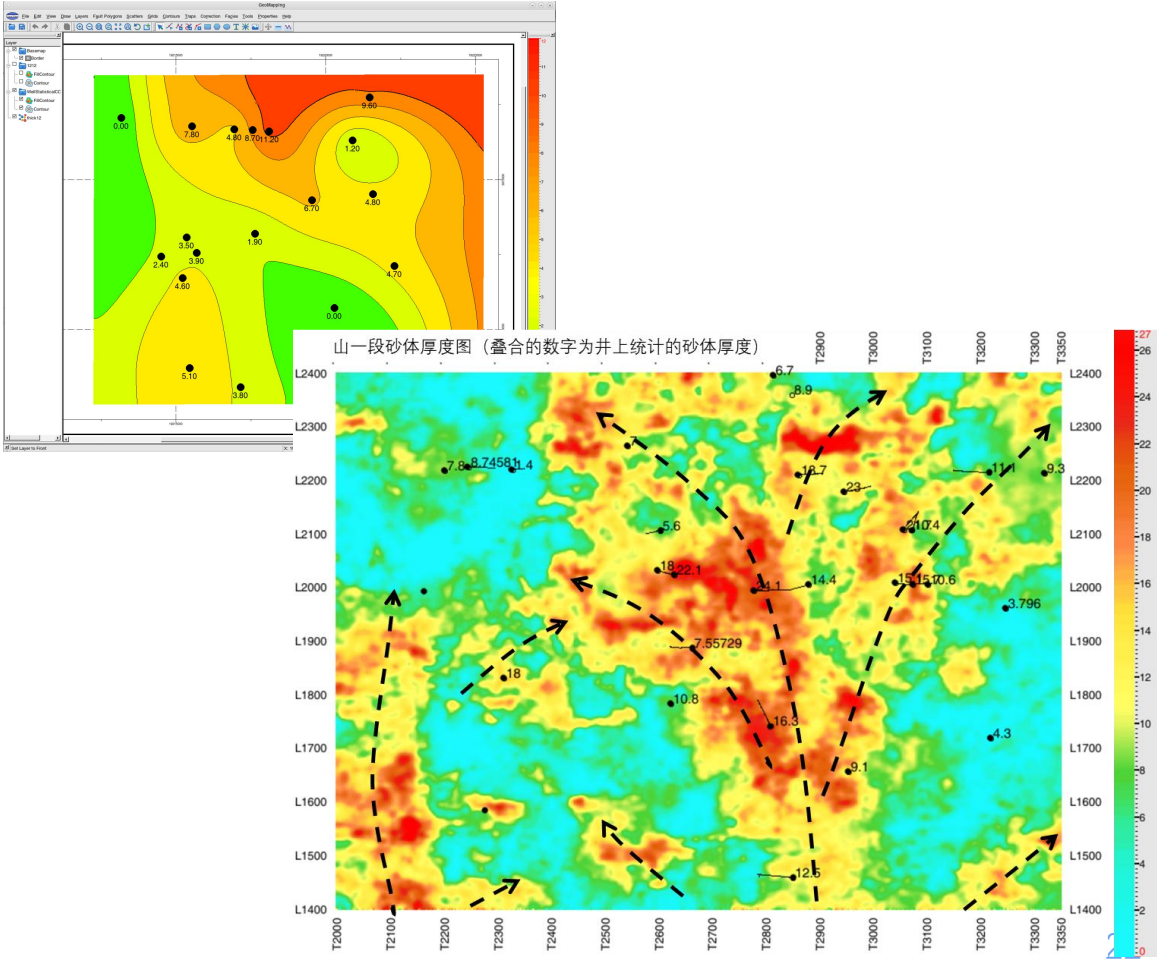
Statistics Information									
Statistics Information									
	Well Name	X(Well)	Y(Well)	X(Top)	Y(Top)	Loss Ratio(%)	otal Thickness(r	Percent(%)	
1	C796	19216390.00	3968749.00	19215462.04	3968711.22	72.99	5.1	5.76	1
2	C7107	19221255.00	3968884.00	19222572.26	3968783.23	81.85	1.3	1.41	1
3	C595c	19215012.00	3972564.00	19215228.08	3971710.08	84.96	4.6	4.74	2
4	C595	19215012.00	3972564.00	19215352.62	3973060.36	88.35	3.5	3.32	1
5	C5107	19222627.91	3972759.42	19222292.19	3972112.41	58.27	4.7	4.01	1
6	C5100	19217732.59	3972613.63	19217638.68	3973192.87	91.24	1.9	2.13	1
7	C5-96	19215009.00	3972571.00	19215694.68	3972554.28	86.25	3.9	4.43	1
8	B43	19214499.62	3972438.18	19214508.63	3972429.51	91.26	2.4	2.65	1
9	B4105	19221636.95	3974570.97	19221574.72	3974503.94	83.59	4.8	5.25	2
10	B4101	19218745.36	3974670.16	19219544.03	3974306.24	73.26	6.7	7.05	3
11	B3-99	19216944.97	3976661.64	19218114.58	3976599.51	73.56	11.2	9.49	4

All Well is calculated successfully !

Scatter Column

X: X(Top) Y: Y(Top) Z: Total Thickness(m) V: Total Thickness(m) Name

Save as Scatter ... Save as ASCII ... View Contours ... View Facies ... Close





基于油气水统计与基于沉积相统计的输入输出设置及参数设置与岩性统计基本相同。

Well OGW

Input and Output | Parameter

Select OGW

Available	2	Selected	4
Dry layer Water layer		Data Name	
		Gas-bearing water layer	
		Gas-water layer	
		Gas layer	
		Poor gas layer	

Filter

Sortable

Save as Data Set

Statistic Information

Mode MD Threshold Value 0

Well Information

☒ Well Name ☒ X Coordinate(Well) ☒ Y Coordinate(Well) ☐ X Coordinate(Top) ☐ Y Coordinate(Top)

☐ Strata Thickness ☐ Start Depth ☐ End Depth ☐ KB

OGW Information

☒ Total OGW Thickness ☒ Total OGW Percent ☒ Total OGW Layers ☒ Advantage OGW

☒ OGW Loss Rate ☐ Single OGW Information

Select Facies

Available	4	Selected	3
Facies55 Facies Facies66 Facies45		Data Name	
		Facies33	
		F55	
		Facies11	

Filter

Save as Data Set

Statistic Information

Mode MD Threshold Value 0

Well Information

☒ Well Name ☒ X Coordinate(Well) ☒ Y Coordinate(Well) ☐ X Coordinate(Top) ☐ Y Coordinate(Top)

☐ Strata Thickness ☐ Start Depth ☐ End Depth ☐ KB

Facies Information

☒ Total Facies Thickness ☒ Total Facies Percent ☒ Total Facies Layers ☒ Advantage Facies ☒ Advantage Lithology

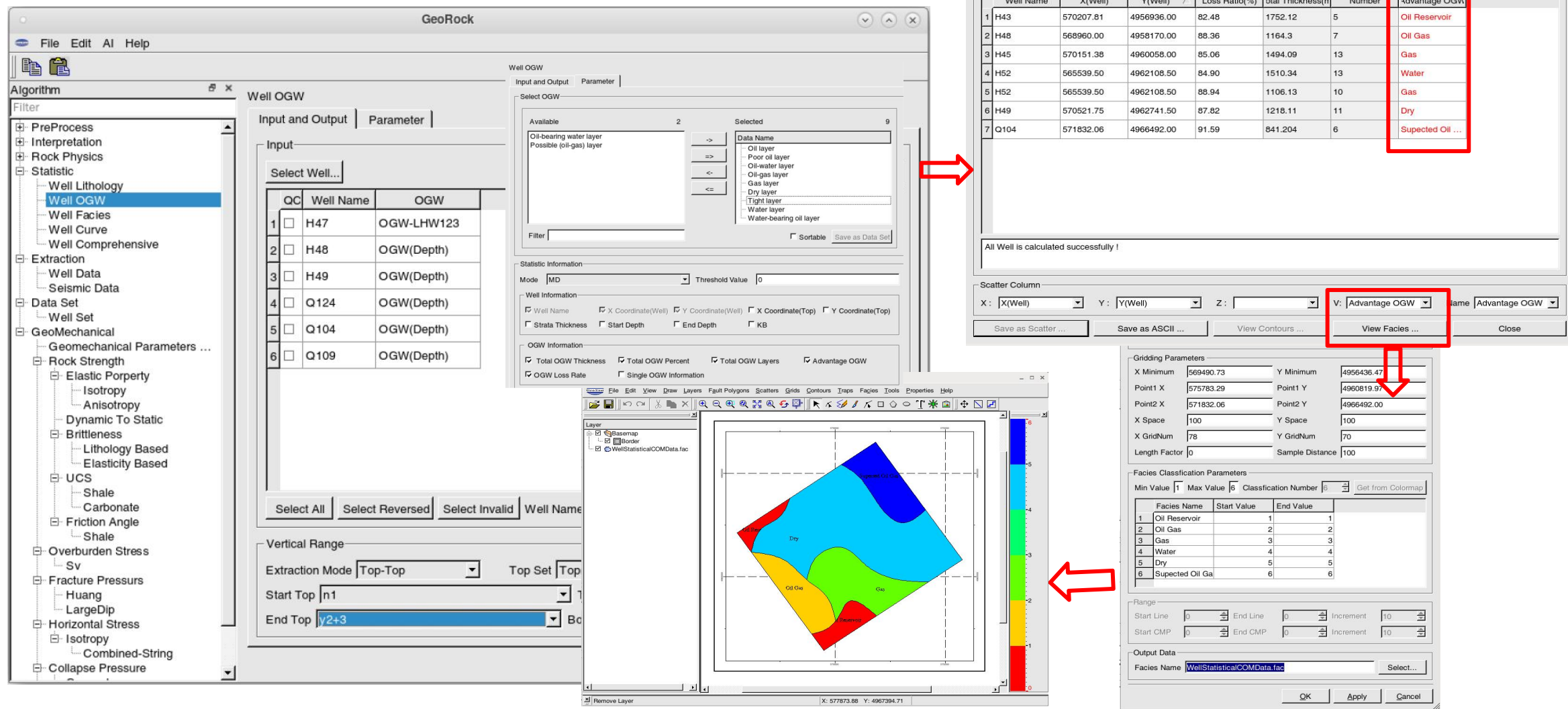
☒ Facies Loss Rate ☐ Single Facies Information



测井统计

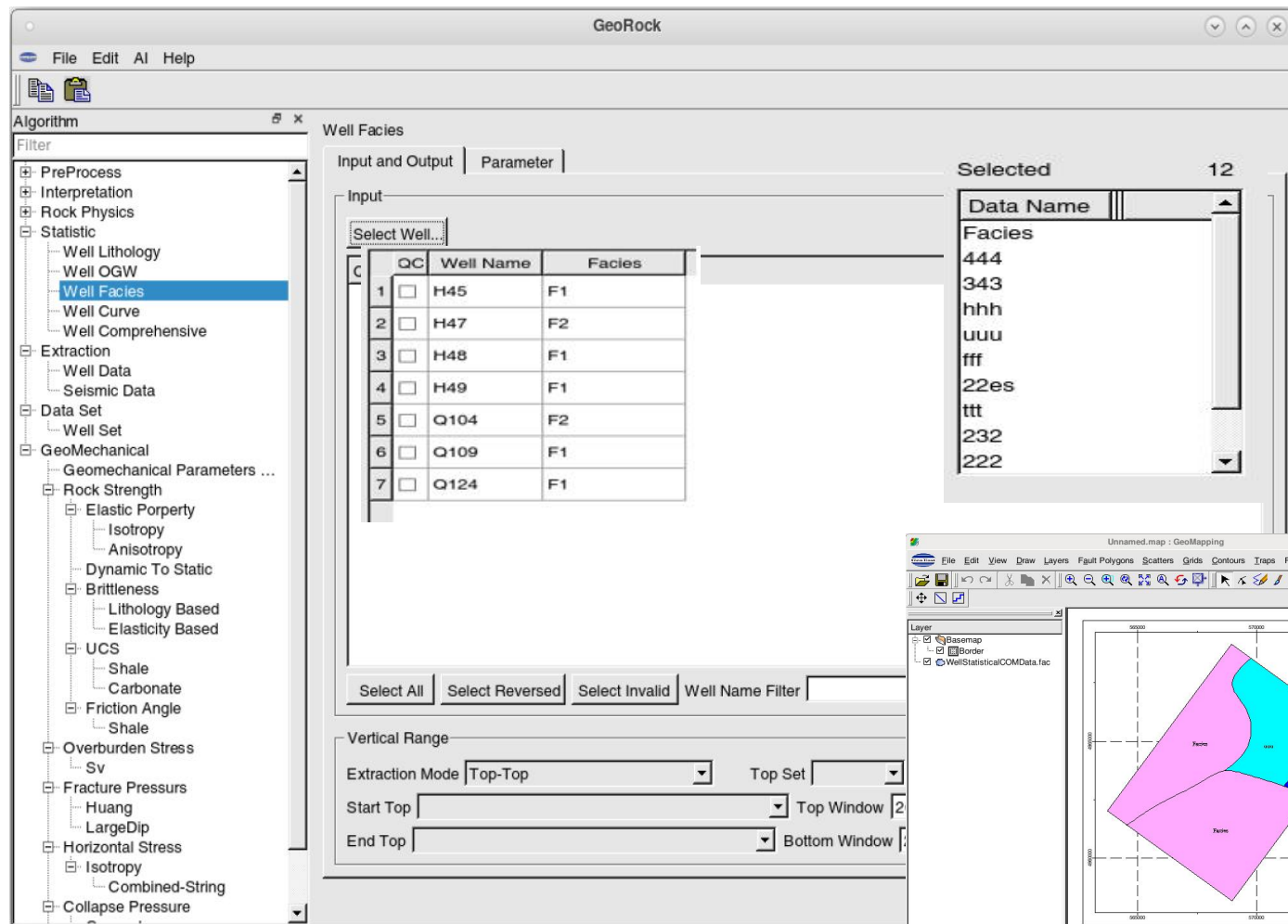


对每口井的优势油气水进行统计，并和平面成图通讯，生成优势油气水分布图





对每口井的优势沉积相进行统计，并和平面成图通讯，生成优势沉积相分布图



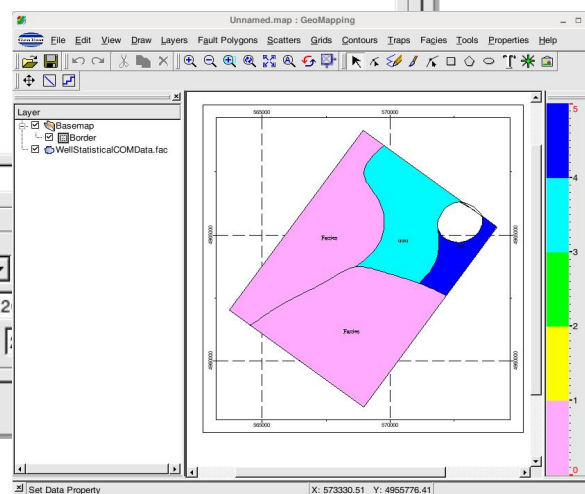
Statistics Information

Well Name	X(Well)	Y(Well)	Loss Ratio(%)	otal Thickness(n	Percent(%)	Number	Advantage Lith	Advantage Facies
1 H45	570151.38	4960058.00	96.85	315.276	3.15	1	Arenaceous ...	Facies
2 H47	567291.69	4966908.50	94.87	512.912	5.13	4	Arenaceous ...	11
3 H48	568960.00	4958170.00	92.52	747.6	7.48	2	Arenaceous ...	Facies
4 H49	570521.75	4962741.50	100.00	0	0.00	0		
5 Q104	571832.06	4966492.00	94.95	505.475	5.05	5	Arenaceous ...	34
6 Q109	574183.38	4965309.50	97.09	290.765	2.91	3	Arenaceous ...	uuu
7 Q124	573021.69	4965989.00	94.65	535.458	5.35	4	Arenaceous ...	ttt

All Well is calculated successfully!

Scatter Column: X: X(Well) Y: Y(Well) Z: V: Advantage Facies Name: Advantage Facies

Buttons: Save as Scatter..., Save as ASCII..., View Contours..., View Facies..., Close



base boundary

Gridding Parameters

X Minimum	568960.00	Y Minimum	4958170.00
Point1 X	574183.38	Point1 Y	4965309.50
Point2 X	568932.46	Point2 Y	4969151.16
X Space	100	Y Space	100
X GridNum	89	Y GridNum	66
Length Factor	0	Sample Distance	100

Facies Classification Parameters

Facies Name	Start Value	End Value
1 Facies	1	1
2 111	2	2
3 434	3	3
4 uuu	4	4
5 ttt	5	5

Range: Start Line 0 End Line 0 Increment 10

Start CMP 0 End CMP 0 Increment 10

Output Data: Facies Name WellStatisticalCOMData.fac

Buttons: OK, Apply, Cancel



基于曲线统计

Well Curve

Input and Output | Parameter

输入输出界面

Input

Select Well... Select Data Type... Remove Clear

	Well Name	POR	Version	SW	Version	Lithology	OGW
1	☐ AB5	POR	1	SW_edit	1	Lith(OWG)	OGW(Depth)
2	☐ C796	POR	1	SW_edit	1	Lith(OWG)	OGW(Depth)
3	☐ C7107	POR	1	SW_edit	1	Lith(OWG)	OGW(Depth)
4	☐ C595c	POR	1	SW_edit	1	Lith(OWG)	OGW(Depth)
5	☐ C595	POR	1	SW_edit	1	Lith(OWG)	OGW(Depth)

Select All Select Reversed Select Invalid Well Name Filter Curve Name Filter

Vertical Range

Extraction Mode Top-Top Top Set Top(Depth) Extend Curve for No Top Joint Curve

Start Top P2h8x Top Window 0

End Top P1s2 Bottom Window 0

Well Curve

Input and Output | Parameter

参数设置界面

Select Curve

Available 0 Selected 2

Data Name

POR SW

Filter

Sortable Save as Data Set

Statistic Information

☐ Constrain Lithology Select Valid Range -9999.00 - 9999.00

Well Information

☒ Well Name ☒ X Coordinate(Well) ☒ Y Coordinate(Well) ☒ X Coordinate(Top) ☒ Y Coordinate(Top)

☒ Strata Thickness ☒ Start Depth ☒ End Depth ☒ KB

Curve Information

☒ Minimum Value ☒ Maximum Value ☒ Average Value ☒ RMS ☒ Median Value

Statistics Information

统计结果

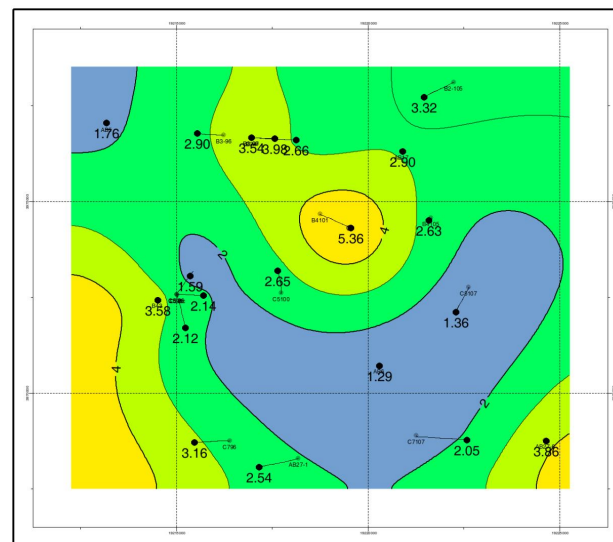
	Well Name	X(Well)	Y(Well)	X(Top)	Y(Top)	Strata Thickness(m)	Start Depth(m)	End Depth(m)	KB(m)	POR(Min)	POR(Max)	POR(Average)	POR(RMS)	POR(Median)	SW(Min)	SW(Max)	SW(Average)	SW(RMS)	SW(Median)
1	AB5	19213178.00	3977032.00	19213173.70	3977046.94	83.4	4047	4130.4	1262.31	0.000	5.210	1.139	1.763	0.032	67.383	99.932	95.187	95.294	96.661
2	C796	19216390.00	3968749.00	19215462.04	3968711.22	88.5	4218.5	4307	1281.99	0.000	7.910	2.804	3.164	2.830	33.474	99.939	82.023	82.842	80.726
3	C7107	19221255.00	3968884.00	19222572.26	3968783.23	92	4211	4303	1149.02	0.000	6.582	1.298	2.051	0.598	43.602	99.669	94.590	95.032	97.511
4	C595c	19215012.00	3972564.00	19215228.08	3971710.08	97.1	4211.62	4308.72	1305.04	0.003	8.356	1.463	2.118	1.135	24.342	99.992	93.829	94.813	98.351
5	C595	19215012.00	3972564.00	19215352.62	3973060.36	105.57	4153.93	4259.5	1305.04	0.088	8.167	0.952	1.591	0.665	29.943	99.998	95.622	96.300	98.700
6	C5107	19222627.91	3972759.42	19222292.19	3972112.41	117.17	4108.69	4225.86	1221.51	0.001	7.364	0.753	1.356	0.080	38.066	99.995	96.720	97.196	99.995
7	C5100	19217732.59	3972613.63	19217638.68	3973192.87	89	4108	4197	1248.24	0.000	6.698	1.667	2.651	0.000	46.642	99.900	87.540	88.863	99.900
8	C5-96	19215009.00	3972571.00	19215694.68	3972554.28	88	4213	4301	1305.34	0.203	8.567	1.328	2.142	0.815	38.388	99.978	92.874	93.636	97.029
9	B43	19214499.62	3972438.18	19214508.63	3972429.51	90.4	4064.8	4155.2	1307.46	0.017	7.361	3.054	3.585	2.504	27.238	99.917	75.058	79.806	98.539
10	B4105	19221636.95	3974570.97	19221574.72	3974503.94	91.4	4001.1	4092.5	1276.23	0.000	9.206	2.107	2.627	2.456	33.492	99.978	96.152	96.646	98.551
11	B4101	19218745.36	3974670.16	19219544.03	3974306.24	95	4141	4236	1238.62	0.164	8.739	5.133	5.355	4.624	38.675	99.987	60.646	62.250	55.144
12	B3-99	19216944.97	3976661.64	19218114.58	3976599.51	118	4278	4396	1293.71	0.143	9.287	1.884	2.657	0.830	45.093	99.993	94.863	95.537	99.772

All Well is calculated successfully !

Scatter Column

X: X(Top) Y: Y(Top) Z: Strata Thickness(m) V: Strata Thickness(m)

Save as Scatter ... Save as ASCII ... View Contours ...





测井综合统计

按井、分层对各类储层参数如岩性、油气水类型、沉积相及各类曲线值（最大、平均、RMS 等）进行批量统计与汇总，为储层评价、储量计算和地质建模提供量化依据。

Well Comprehensive

Input and Output | Parameter |

Input

Select Well... Select Data Type... Remove Clear

QC	Well Nam	GR	Version	P_AC	Version	POR	Version	SW	Version	VSH	Version	Lithology	OGW
☐	AB17	GR_ys_rav_std	1	P_AC_final	1	POR	1	SW_edit	1	VSH_edit	1	Lith(OWG)	OGW(Depth)
☐	AB27-1	GR_ys_rav_std	1	P_AC_final	1	POR	1	SW_edit	1	VSH_edit	1	Lith(New1)	OGW(Depth)
☐	AB27-4	GR_ysTVD	1	P_AC	2	POR	1	_edit_null	1	VSH_edit	1	Lith(OWG)	OGW(Depth)
☐	AB27-6	GR_ys_rav_std	1	P_AC_final	1	POR	1	SW_edit	1	VSH_edit	1	Lith(OWG)	OGW(Depth)
☐	AB5	GR_ys_rav_std	1	P_AC_final	1	POR	1	SW_edit	1	VSH_edit	1	Lith(OWG)	OGW(Depth)
☐	AB6	GR_ys_rav_std	1	P_AC_final	1	POR	1	SW_edit	1	VSH_edit	1	Lith(OWG)	OGW(Depth)
☐	B2-105	GR_ys_rav_std	1	P_AC_final	1	POR	1	SW_edit	1	VSH_edit	1	Lith(OWG)	OGW(Depth)
☐	B24	GR_ys_rav_std	1	P_AC_final	1	POR	1	SW_edit	1	VSH_edit	1	Lith(OWG)	OGW(Depth)
☐	B3-96	GR_ys_rav_std	1	P_AC_final	1	POR	1	SW_edit	1	VSH_edit	1	Lith(OWG)	OGW(Depth)

Select All Select Reversed Select Invalid Well Name Filter Curve Name Filter

Vertical Range

Extraction Mode Top-Top Top Set Top(Depth) Extend Curve for No Top Joint Curve

Start Top P2h8x Top Window 0

End Top P1s1 Bottom Window 0

Well Comprehensive

Input and Output | Parameter |

Selected Data

Lithology Fine sand,Medium sand 选择要参与统计的岩性

OGW Gas layer, Gas-water layer, Poor gas layer, Gas-bearing water layer

Facies

Curve GR,P_AC,POR,SW,VSH

Statistic Information 统计模式, 测深/垂深

Mode TVD Threshold Value 0 阈值, 厚度小于此数值的段不参与统计

Valid Range -9999.00 - 9999.00

Well Information

☒ Well Name ☒ X Coordinate(Well) ☒ Y Coordinate(Well) ☒ X Coordinate(Top) ☒ Y Coordinate(Top)

☒ Strata Thickness ☒ Start Depth ☒ End Depth ☐ KB

Lithology/OGW/Facies

☒ Lithology Thickness ☒ OGW Thickness ☐ Facies Thickness ☒ OGW Type ☒ Facies Type

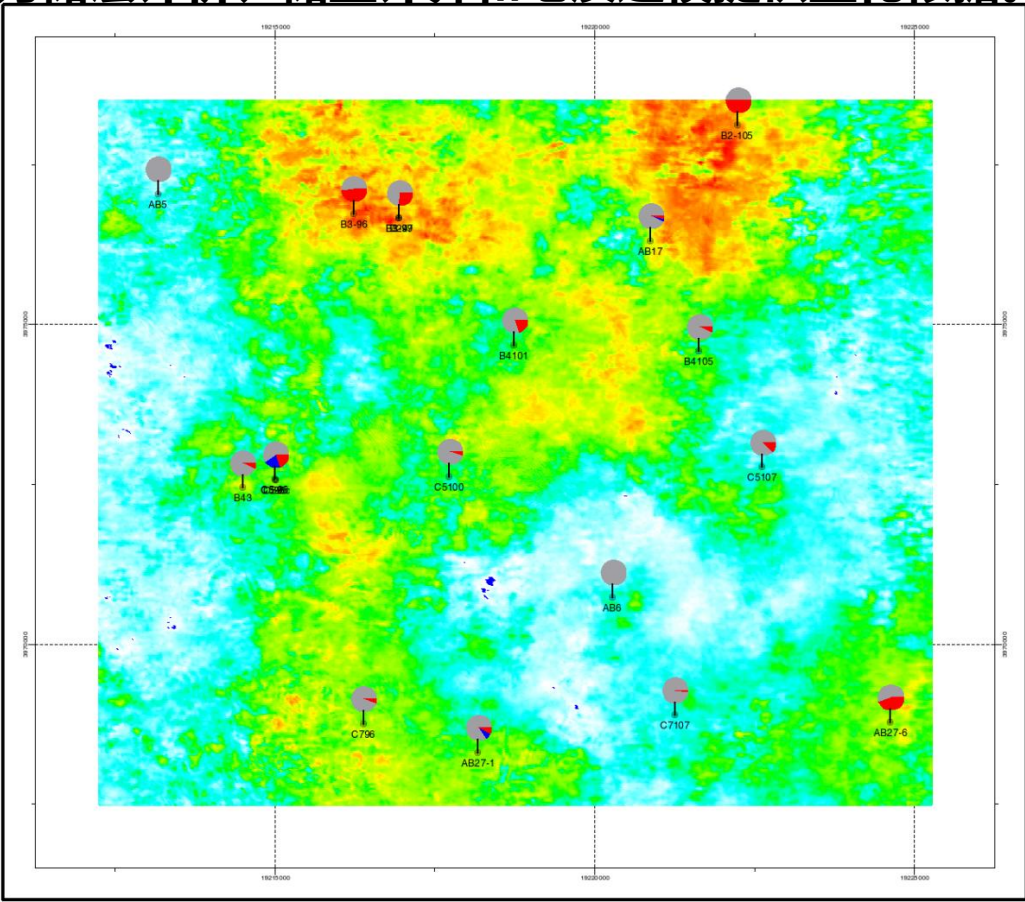
Oil/Gas Thickness

Type	1	2	3	4
Gas layer				
Gas-water layer				
Poor gas layer				
Gas-bearing water layer				
Oil/Gas	1	1	1	1
Water	0	0	0	0
Dry	0	0	0	0

油气、水、干层在某一类解释结论中的比例。三者之和为1。

Curve Information

☒ Average Value ☒ Minimum Value ☒ Maximum Value ☒ RMS ☒ Median Value



当参数只勾选油气厚度时，生成的数据保存为ASCII，可以在平面成图生成油气水饼状图使用。
平面成图流程为GeoMapping->Layers->Well Information->Oil Gas Water。

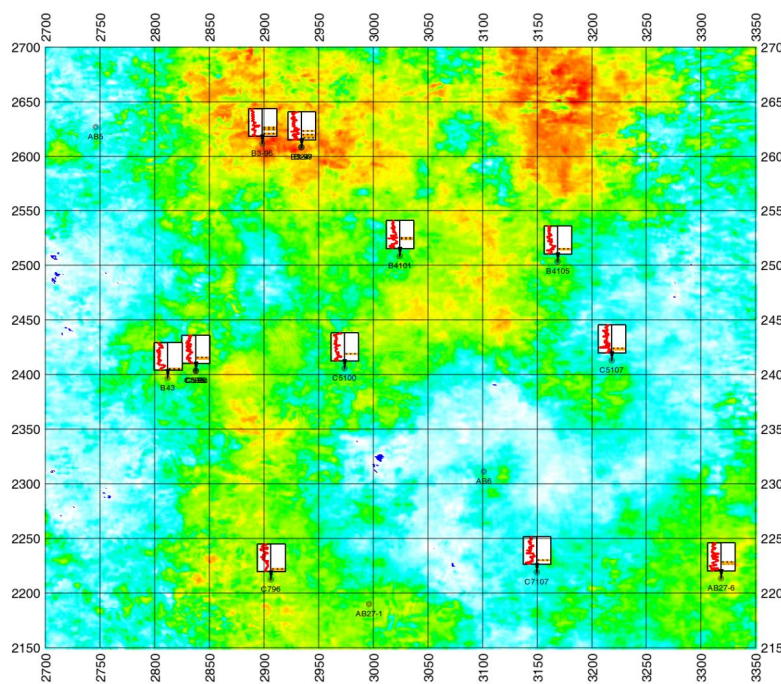
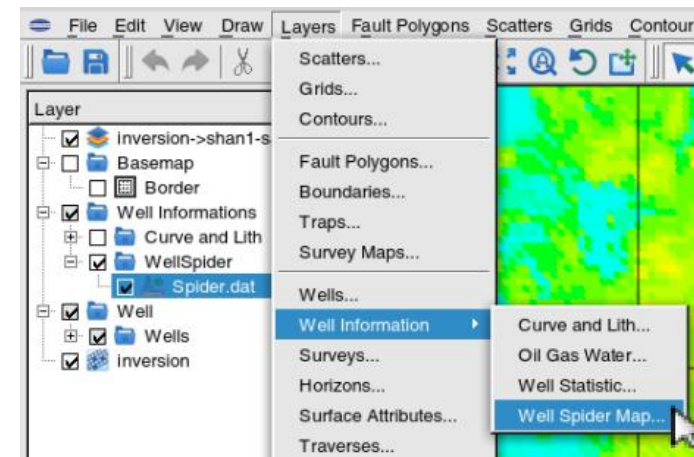


测井数据提取

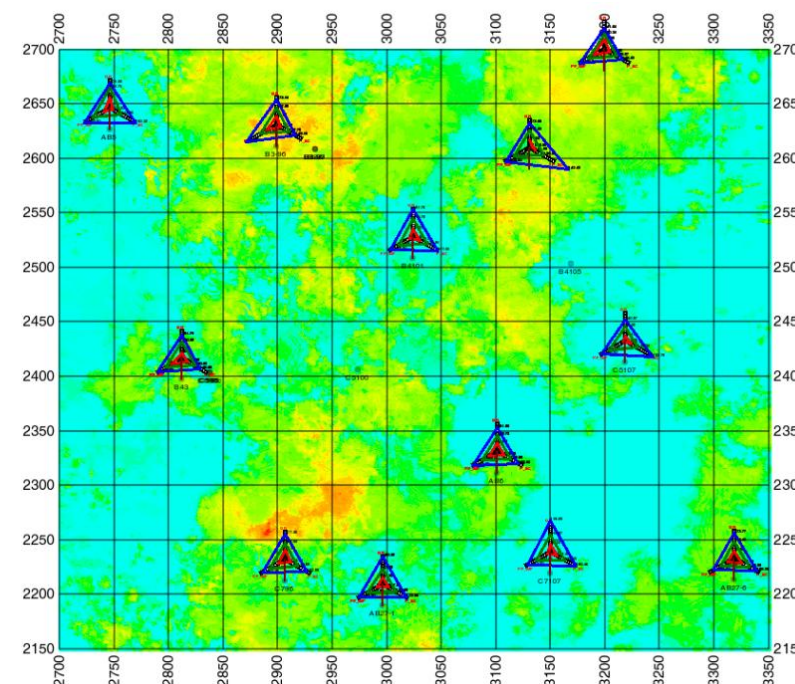
将一定范围的测井数据转化为外部散点数据，数据类型主要包括岩性、油气水、沉积相、曲线等数据，数据格式为.dat，可以通过平面成图系统进行通讯显示。

岩性和曲线提取参数设置

蛛网图提取参数设置



岩性和曲线提取结果



蛛网图结果



地震数据提取

地震数据提取是指对地震数据体沿井轨迹提取对应的曲线。在地震数据提取过程中，需要提供相应的井时深关系。

Seismic Data

Input and Output | Parameter

Input

Select Well... Change DT Relation 选择相应的时深关系曲线 Remove Clear

QC	Well Name	DT	Version
1	☐ AB5	AB5 : DT_1225	1
2	☐ C796	C796 : DT_1225	1
3	☐ C7107	C7107 : DT_1225	1
4	☐ C595c	C595c : DT_1225	1
5	☐ C595	C595 : DT_1225	1
6	☐ C5107	C5107 : DT_1225	1

Select All Select Reversed Select Invalid Well Name Filter

Vertical Range

Extraction Mode 设置提取深度范围

Output

Data Type Log Curve 1#H2S

Curve Name Prefix + Current Curve Name + Suffix

Curve Interval ☒ As Original Curve ☐ User Define 0.125

Curve Version New Version Current Last version + 1

Seismic Data

Input and Output | Parameter

Parameters 选中工区与反演结果

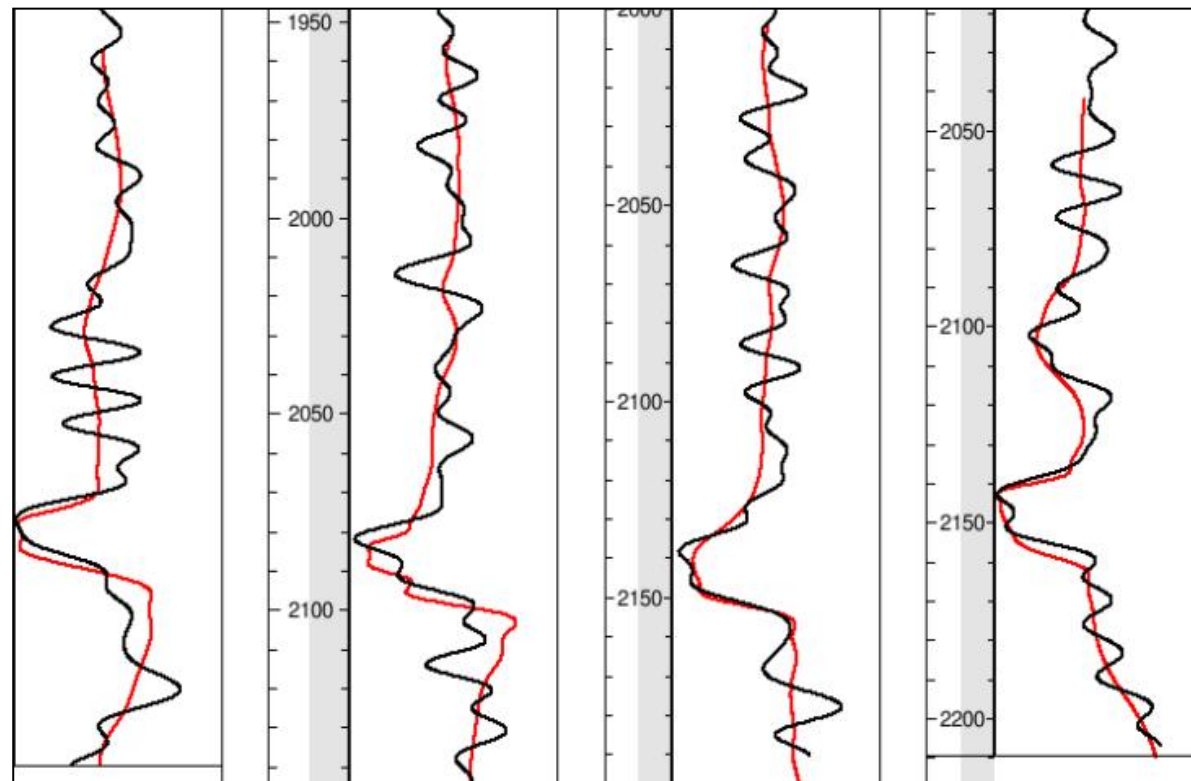
Survey Type 3D Survey Name Inversion

Volumn Name Pre-MGI.Vp_Vs.PreGi

Valid Distance 9999

Extraction Range

Line Range 1 CMP Range 1



黑色：低通滤波后的纵波阻抗；红色：从反演结果中提取的伪井曲线

将伪井曲线与低通滤波后的井曲线进行对比。反演结果与井曲线越接近，反演精度越高。

感谢大家对GeoEast软件的 信任和支持!

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