LWD MEMORY LOG

BAKER HUGHES a GE company

Gamma Ray, Azimuthal Gamma Ray

Scale: **1:240 MD**

Depth Reference: **Driller's Depth**

Company: Bonanza Creek
Well: Wetco Farms A11-4-9MRLNB
Field: Weld
County: Weld **Country:** United States
State: Colorado

Status: **Final Print**

API No: 05-123-47807
Job ID: 109466388

Surface Location:
Latitude: 040° 20' 51.860" N
Longtitude: 104° 27' 06.044" W
SEC: 4 TWN: 4N RGE: 63W

Other Services:
Directional

Permanent Datum (P.D.): Mean Sea Level
Elevation: 0.00 ft
Log Measured From: Rig Floor
Above P.D. 4587.00 ft

Elev. KB: N/A
Elev. DF: 4587.00 ft
Elev. GL: 4570.00 ft

Dates		Interval Drilled		Magnetic Field Reference	
Date From:	2018-10-24	Top: (ft)	94.00	Azi Reference North: True	Dip Angle: (deg) 66.82
Date To:	2018-10-29	Bottom: (ft)	13657.00	Total Magnetic Field Strength: (nT)	52275
Spud Date:	2018-10-24			Mag to Reference North Correction: (deg)	8.07

Borehole Record

Hole Size (in)	From (ft)	To (ft)
13.500	94.00	1610.00
8.500	1610.00	13657.00

Casing Record

Size (in)	Weight (lb/ft)	From (ft)	To (ft)
9.625	36.00	1600.00	1610.00

Mud Record

Type	From (ft)	To (ft)
Water Based Mud	94.00	1610.00
Oil Based Mud	1610.00	13657.00

Deviation Record

Hole Size (in)	Interval (ft)	Inc | Az (Start)	Inc | Az (End)
13.500	1516.00	0.00 | 0.00	0.48 | 229.92
9.625	12047.00	0.48 | 229.92	90.00 | 181.01

Acquisition System	Software Version
Baker Hughes Cadence	RT 4.2
DeliverableGen	1.0.8107.2

Other

Rig: Akita 520
Contractor: Akita Drilling
District: RMD Unit: D&E

Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval Top (ft)	Logged Interval Bottom (ft)	Bit Depth Interval From (ft)	Bit Depth Interval To (ft)	Date / Time Start Logging	Date / Time End Logging	Circ. Hours (h)
1	1	13.500	PDC	3.00	Steerable	94.00	1600.00	94.00	1610.00	2018-10-24 22:17	2018-10-25 07:06	6.98
2	2	8.500	PDC	3.00	AutoTrak Curve	1610.00	13644.00	1610.00	13657.00	2018-10-26 14:20	2018-10-29 03:44	51.72

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Bryan Severson	2018-10-24	2018-10-28	Ryan Hull	2018-10-28	2018-10-29

Name	Arrive Wellsite	Depart Wellsite

Mud Properties Record

Date / Time	Run No.	Measured Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2018-10-24 08:58	1	100.00	Water Based Mud	8.5	1	9.5	N/A	0/100	Active Pit	200	0.00
2018-10-26 16:00	2	2258.00	Oil Based Mud	8.9	10	N/A	7.0	85/15	Active Pit	25000	0.00
2018-10-27 18:00	2	7370.00	Oil Based Mud	8.9	10	N/A	7.5	81/19	Active Pit	30000	0.00
2018-10-29 10:04	2	10098.00	Oil Based Mud	9.5	9	N/A	7.2	78/22	Active Pit	35000	0.00

Equipment and Service Data

Run No.	Tool Name	Serial Number	Measurement Description	Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)
1	NaviTrak	DHP1322571	Directional (mag)	15.33	51.90	8.250	0.000
1	NaviTrak	DHP1322571	VSS	15.33	51.90	8.250	0.000
2	ATC_SU	14316009	Near Bit Inclination	5.93	6.93	7.000	4.330
2	ATC_SU	14316009	Near Bit VSS	5.93	6.93	7.000	4.330
2	ATC_MWD	14219805	Gamma (single)	2.74	13.10	7.000	3.250
2	ATC_MWD	14219805	Directional (mag)	12.26	22.62	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
NTK	NaviTrak	Probe Based Directional Module, NaviTrak Platform
ATC_SU	ATC_SU	Auto Trak Curve Steering Unit
ATC_MWD	ATC_MWD	Auto Trak Curve MWD
ATC_LCPM	ATC_LCPM	Auto Trak Curve LCPM

Comments

1 Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging

engineers, depth calibrations and measurements could not be independently verified.

2 Baker Hughes LWD Run 1 utilized 6.75 inch NaviGamma Service (Gamma Ray, Azimuthal Gamma Ray and Directional) behind an 8.5 inch bit and a rotary steerable assembly from 1610 to 13657 feet MD (1610 to 6289 feet TVD).

3 The GRAM data is presented on a scale of 0 to 200 API, per the client's request.

4 The Gamma Ray Apparent (GRAM) log starts at 5000 feet, per customer's request.

5 Short gaps in Gamma Ray Apparent (GRAM) and Azimuthal Gamma Ray Up & Down (GRAUM) and (GRADM) are present throughout the log due to theAuto Trak MWD powering off temporarily while drilling.

Remarks

Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	13650.00	9.625	2	The interval from 13643 to 13657 feet MD (6289 feet TVD) was not logged after being drilled due to sensor to bit offset at well TD.

BAKER HUGHES a GE company

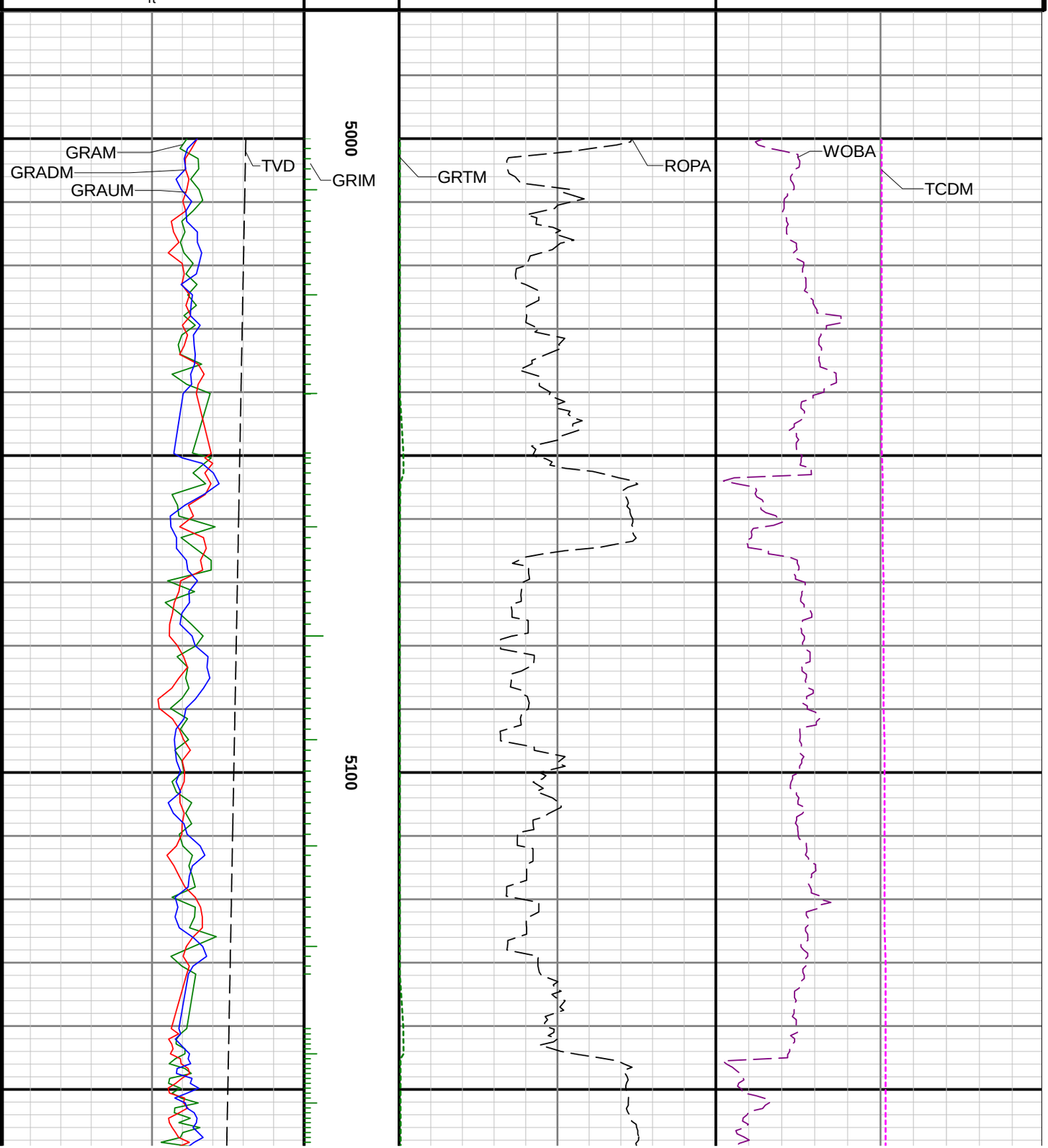
Company	Bonanza Creek
Well	Wetco Farms A11-4-9MRLNB
Interval	**Date From:** 2018-10-24 22:08 **Top:** 94.00 ft
	Date To: 2018-10-29 16:17 **Bottom:** 13657.00 ft
Created	2018-10-29 17:52:07

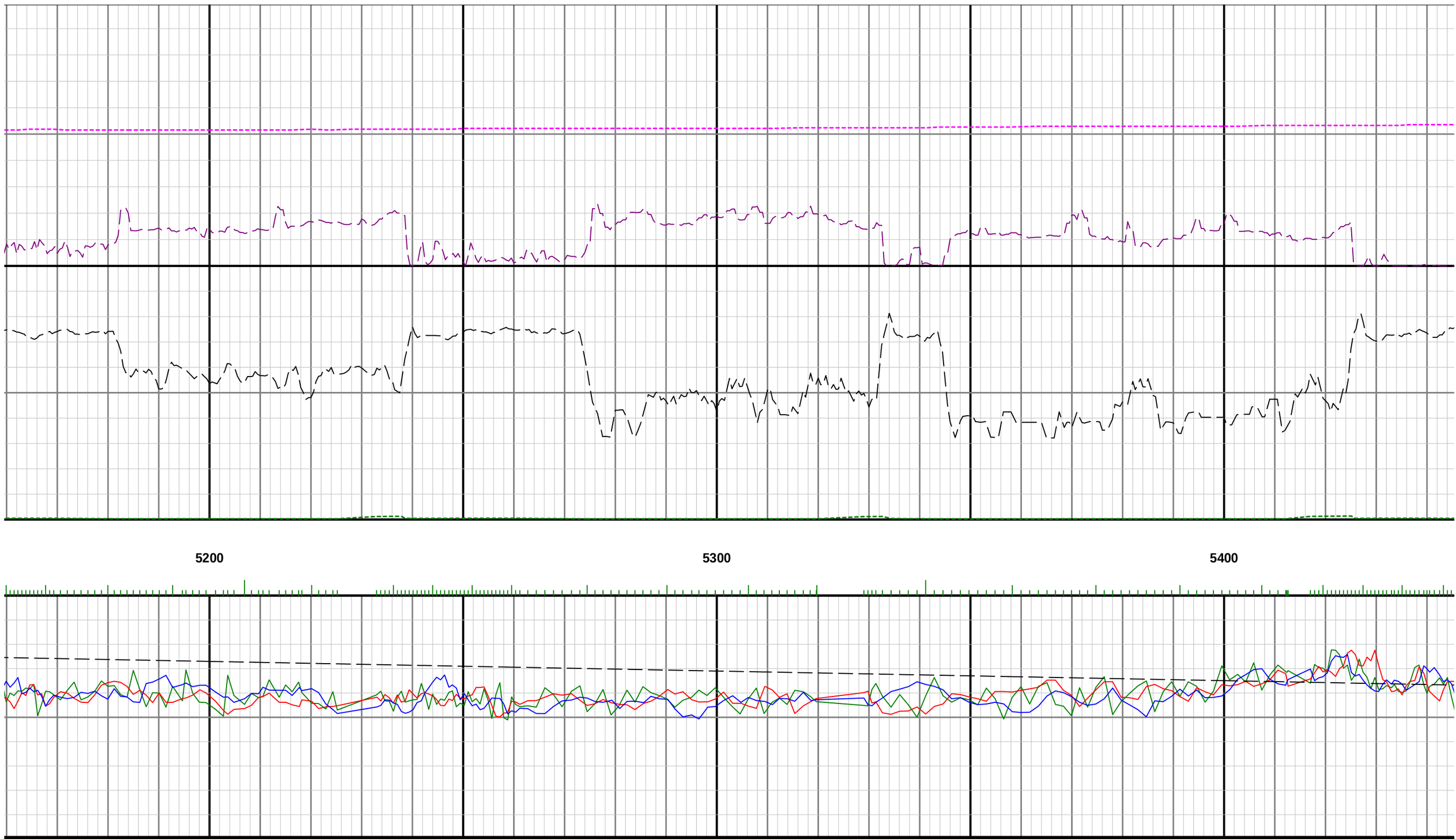
Gamma Ray - Apparent 0.5 ft Average GRAM
0 200
API
Azimuthal Gamma Ray - Apparent - Up Quadrant 0.5 ft Average GRAUM
0 200
API
Azimuthal Gamma Ray - Apparent - Down Quadrant 0.5 ft Average GRADM
0 200
API
True Vertical Depth TVD
7000 4500
ft

MD 1:240 feet

Gamma Time Since Drilled GRTM
0 600
min
Depth Averaged ROP 3 ft Average ROPA
1000 0
ft/h

Weight On Bit, Average 1 ft Average WOBA
0 50
klb
Downhole Temperature TCDM
0 300
degF

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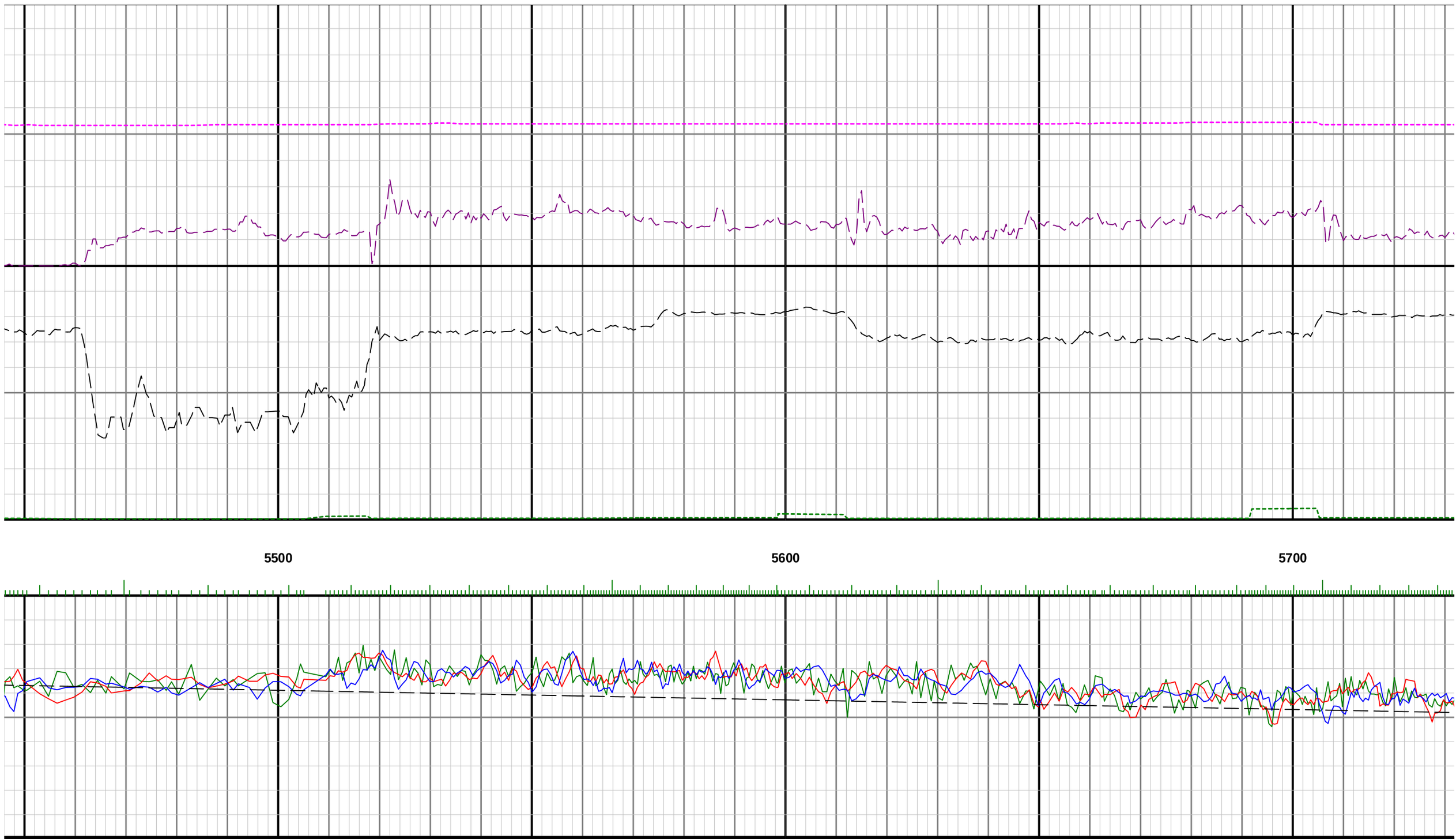
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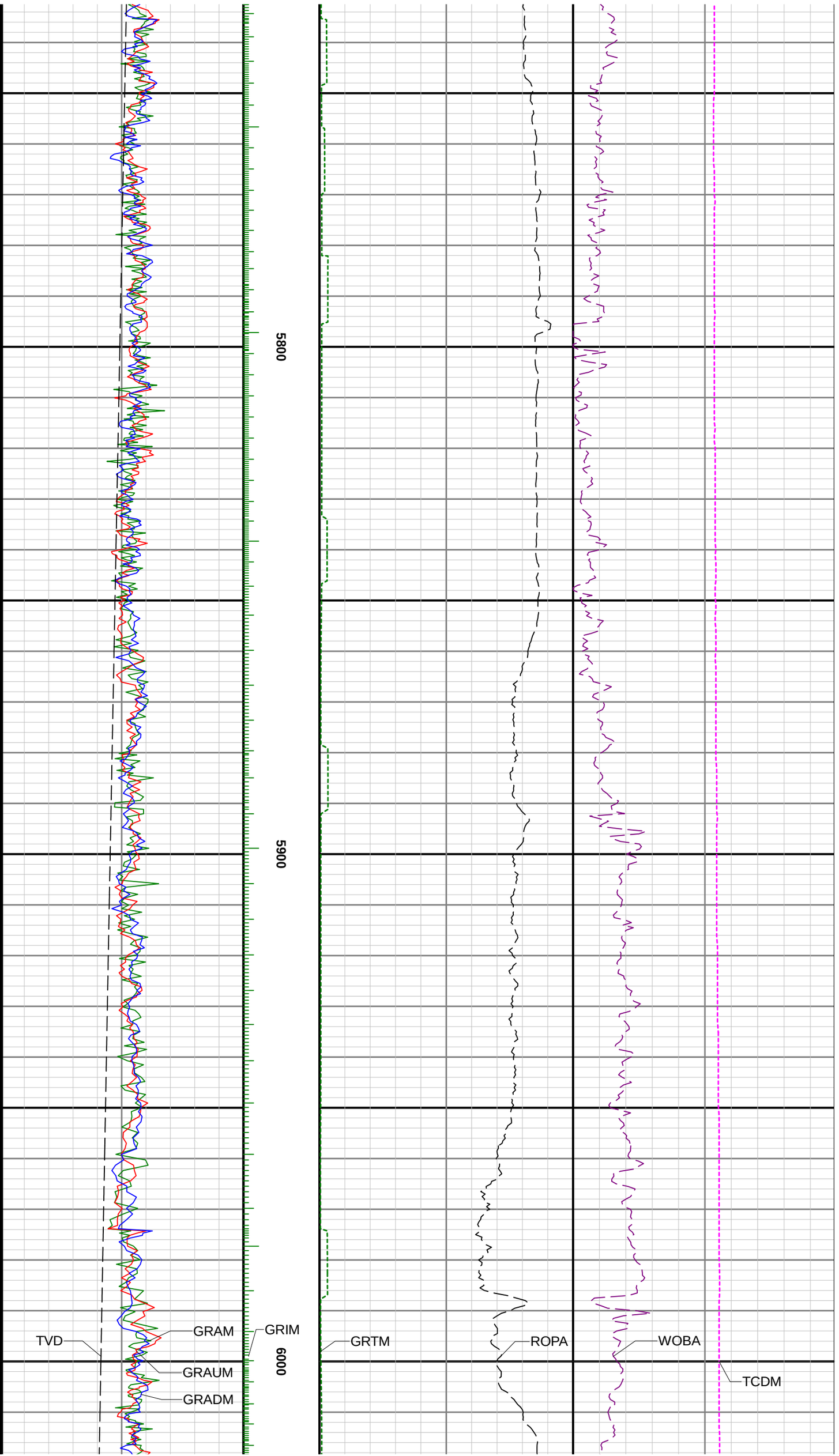
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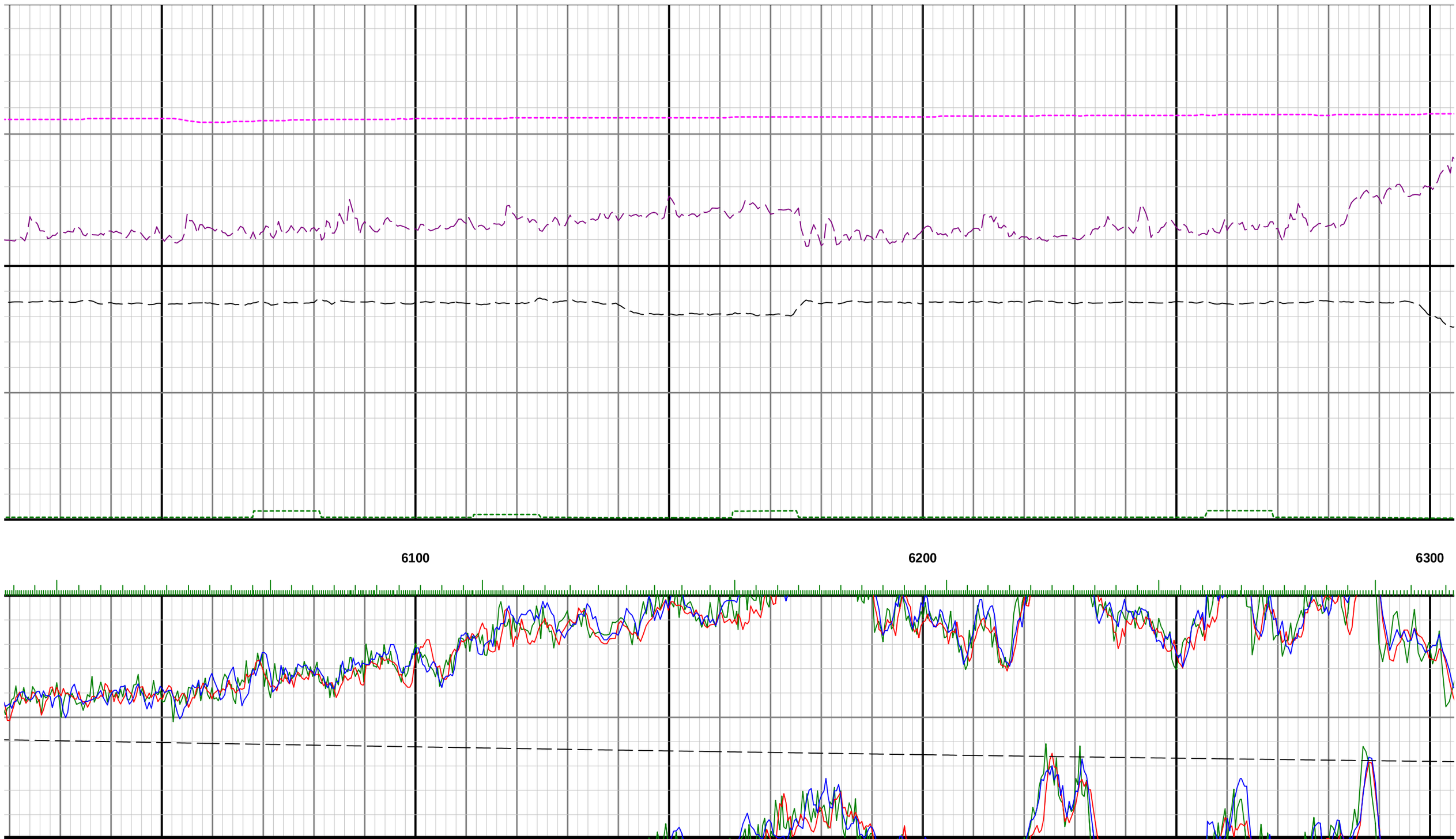
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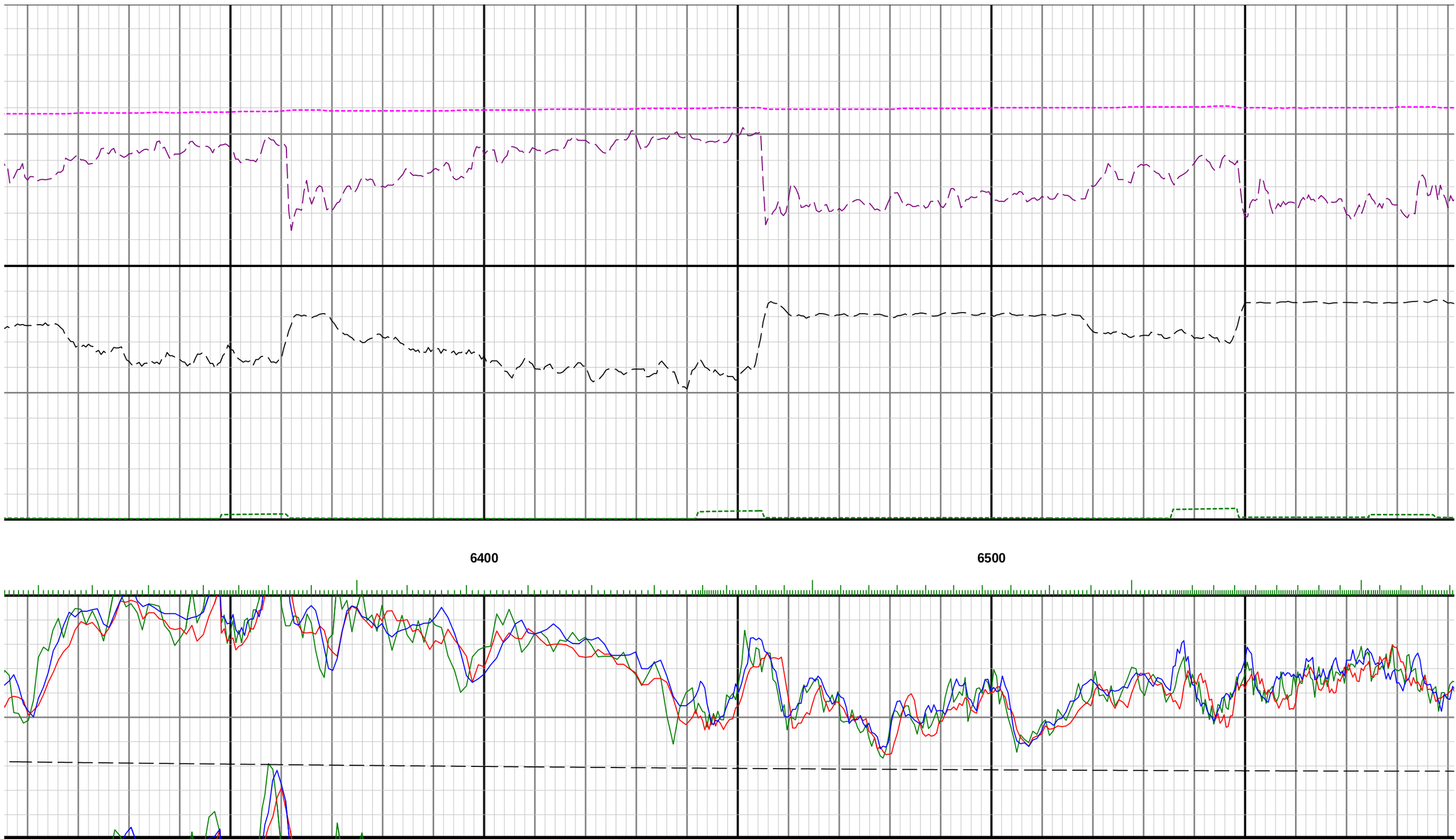
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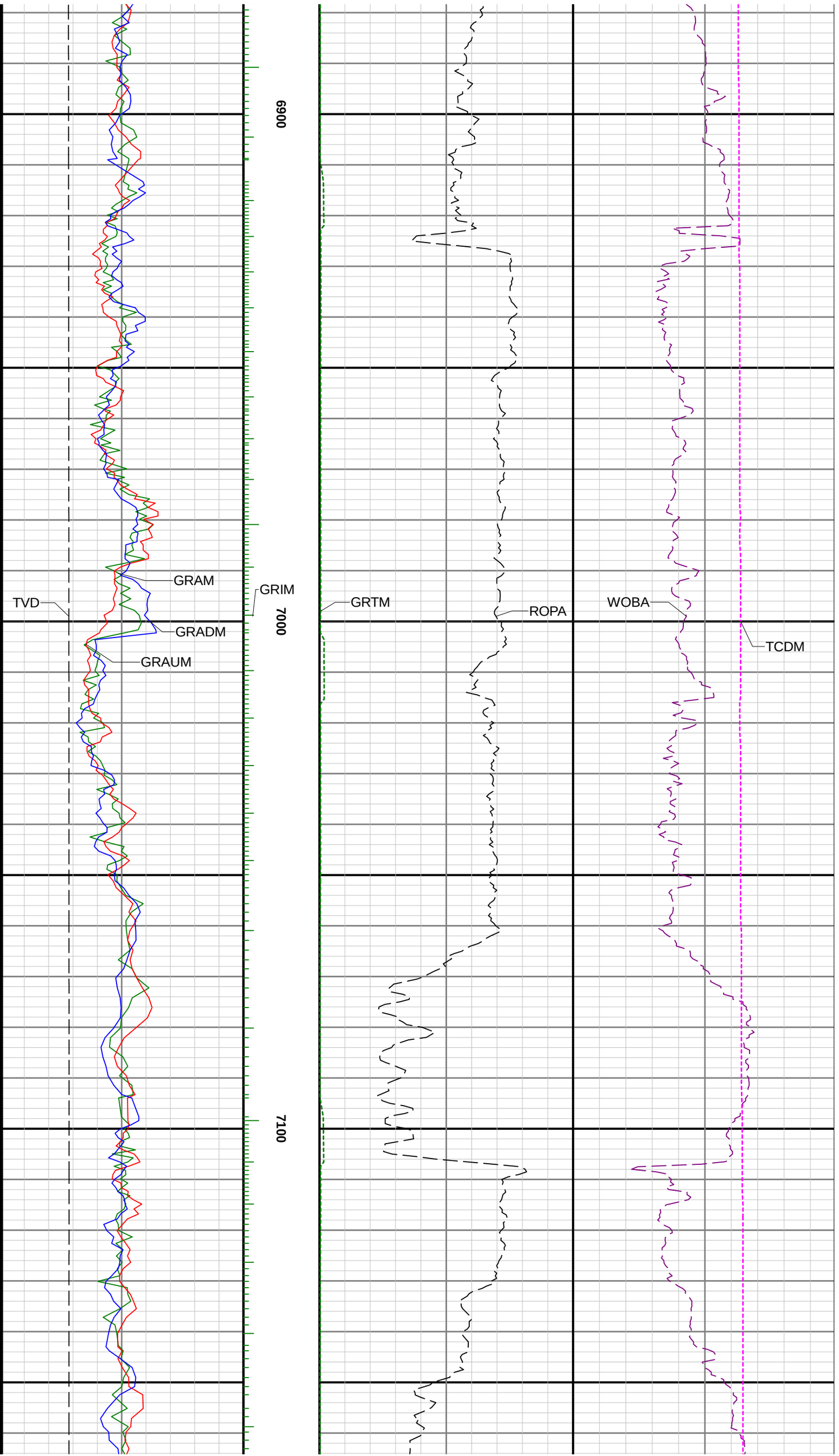
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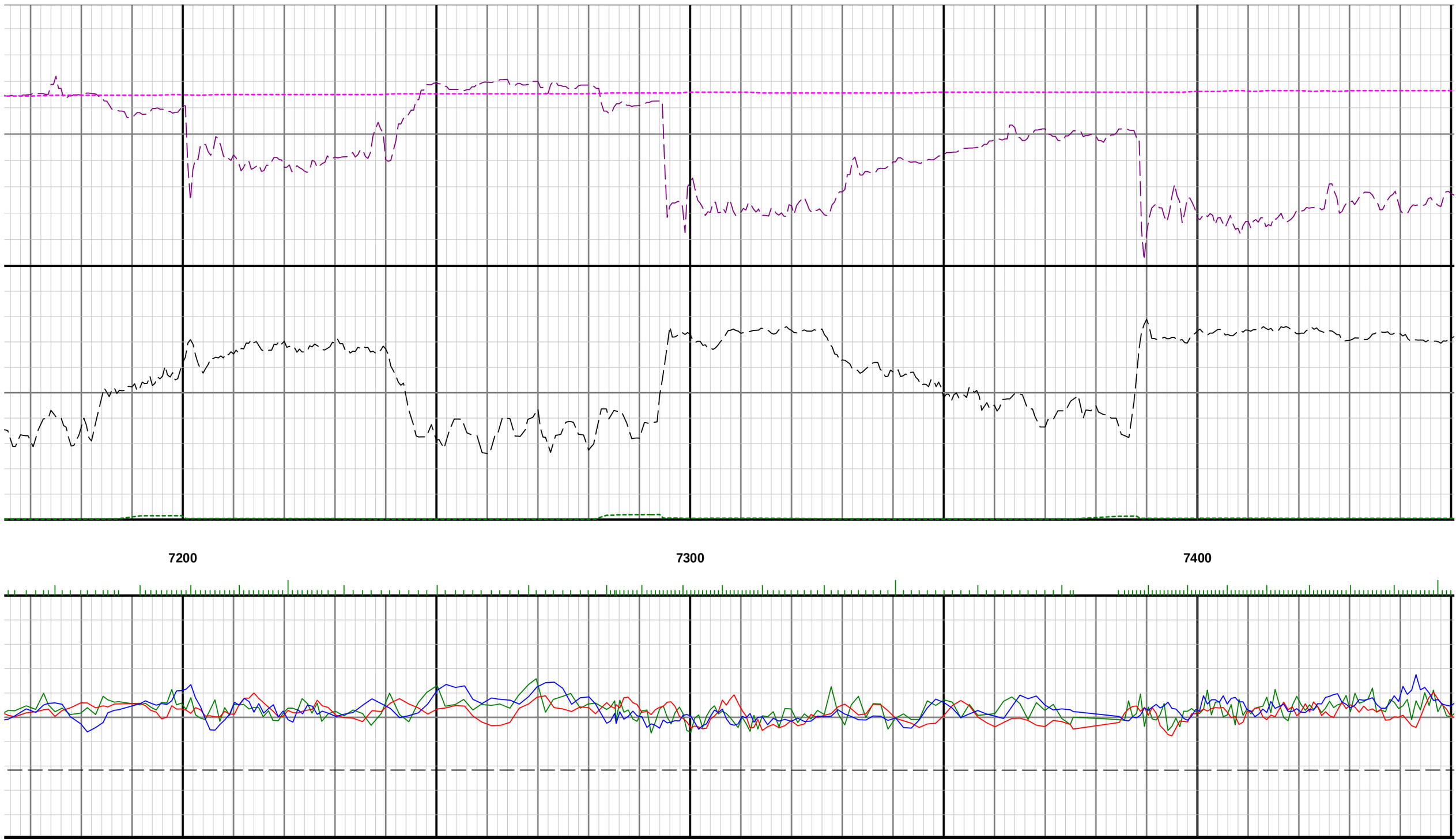
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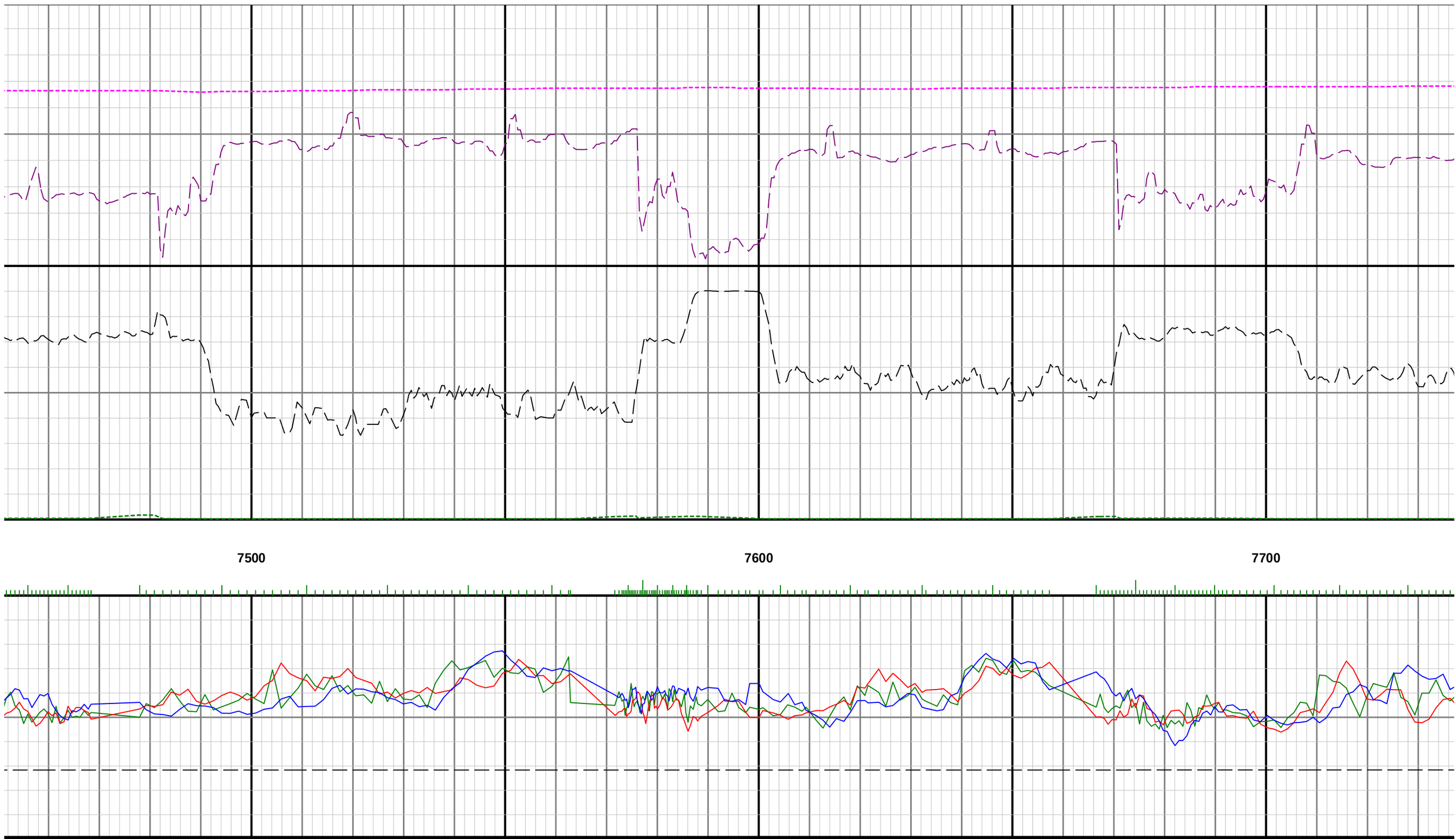
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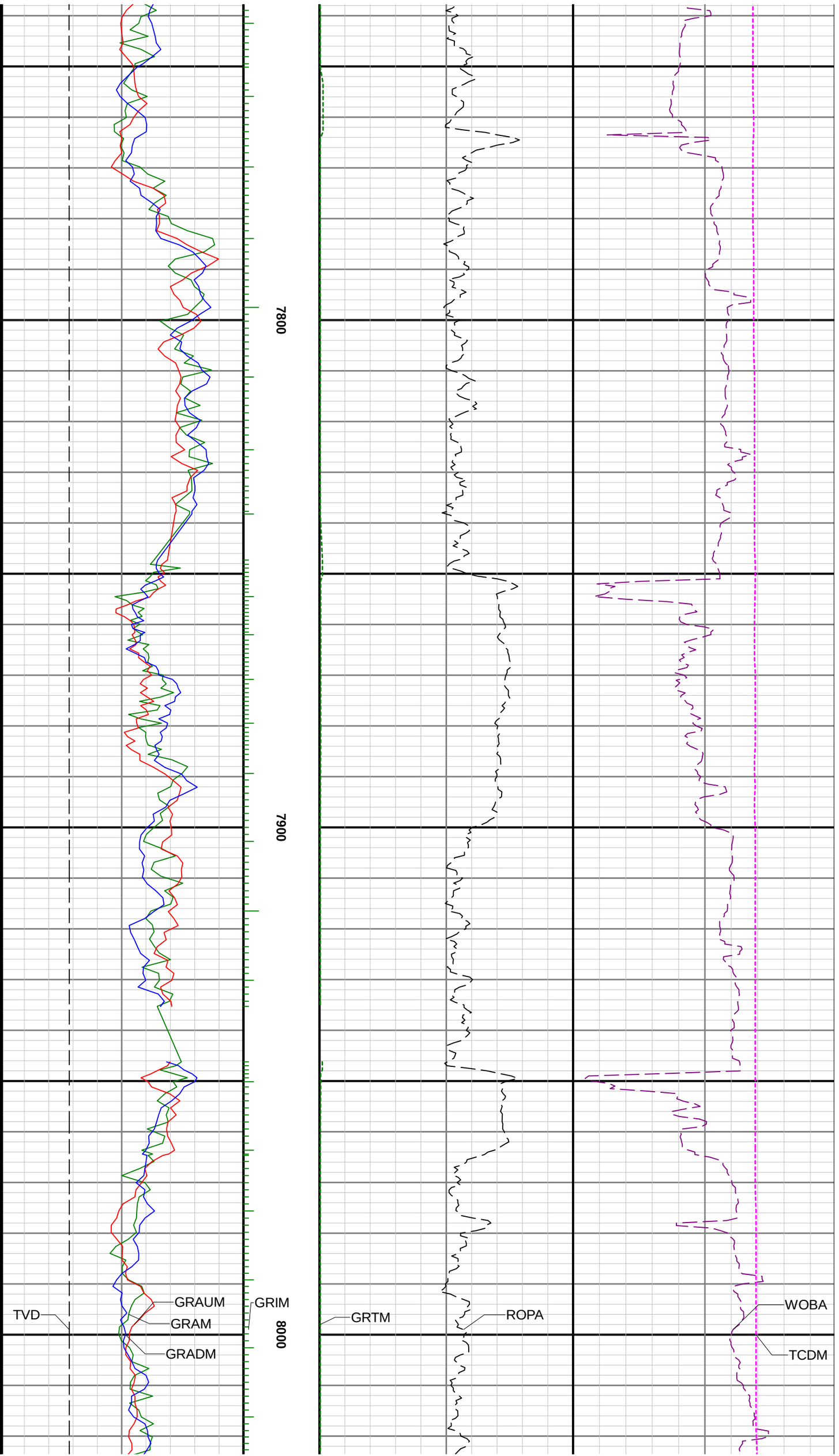
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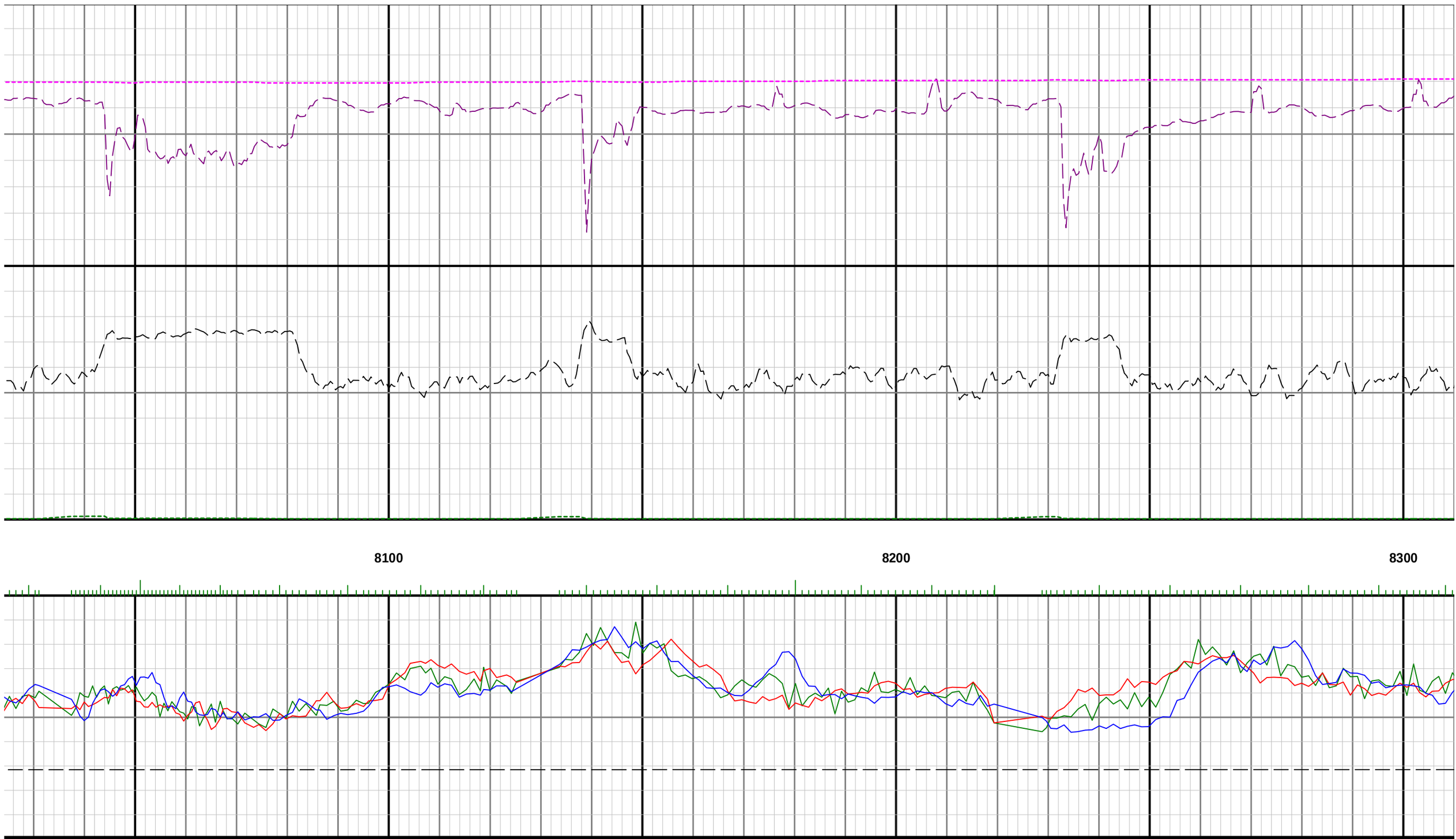
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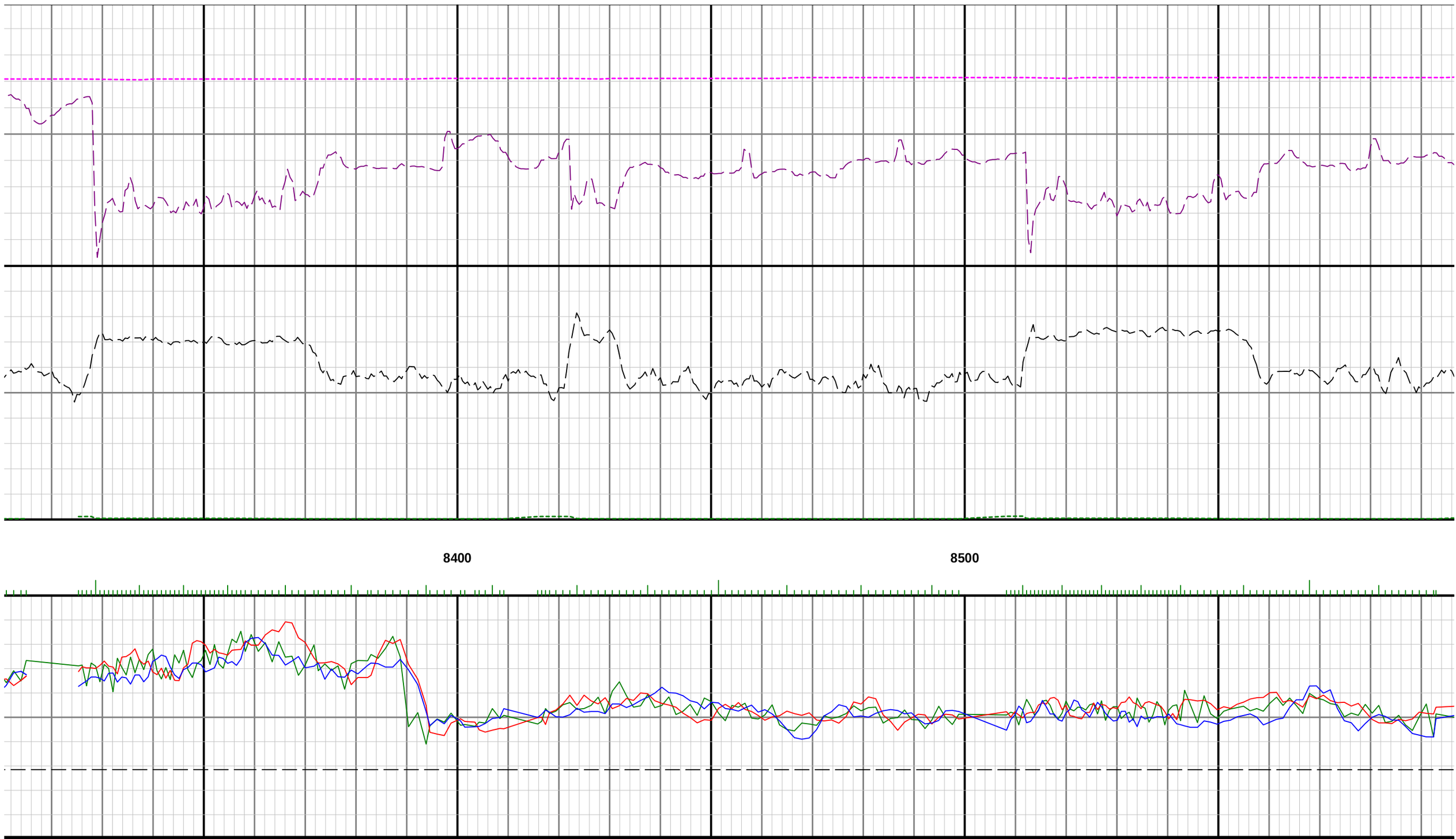
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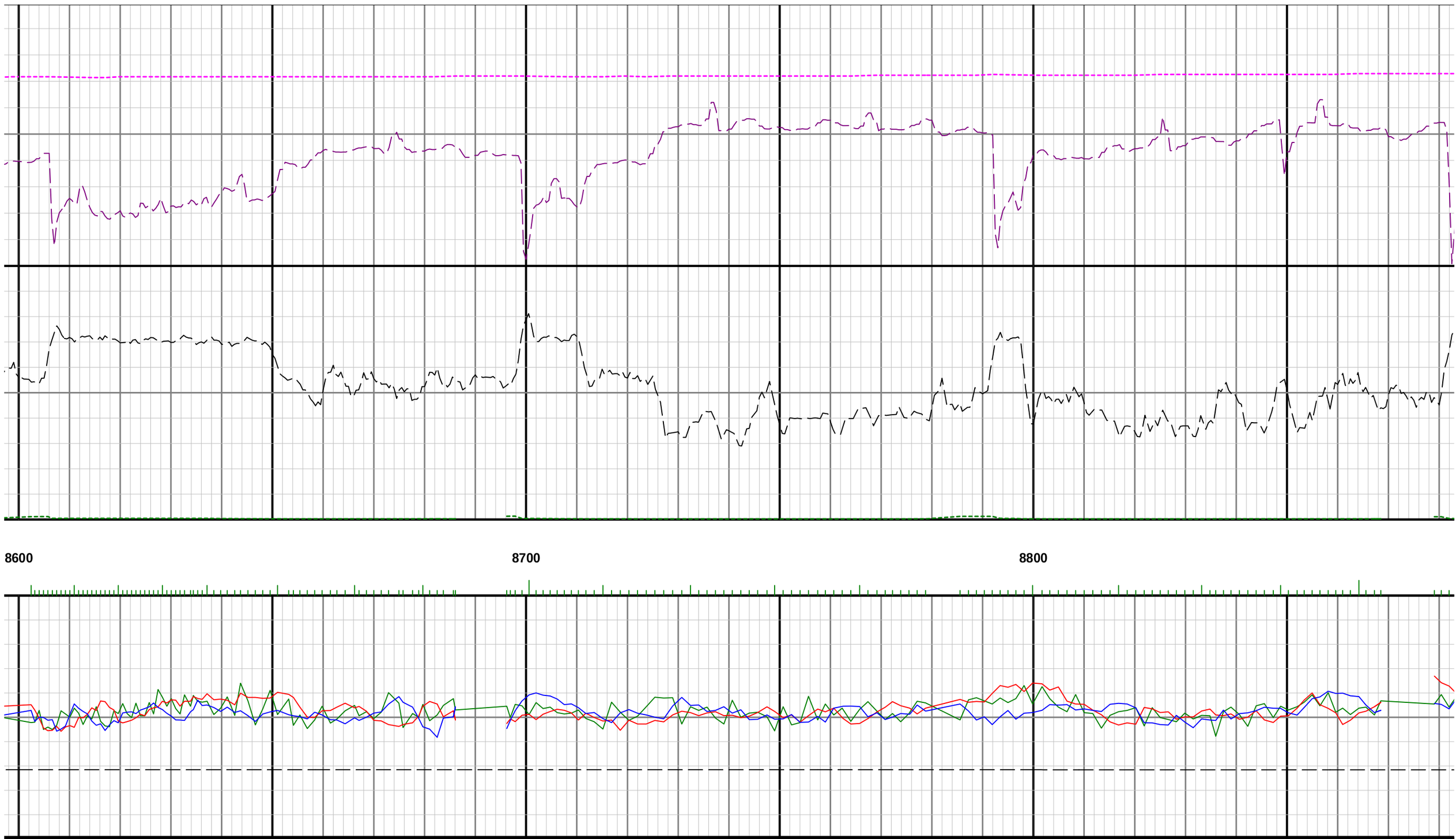
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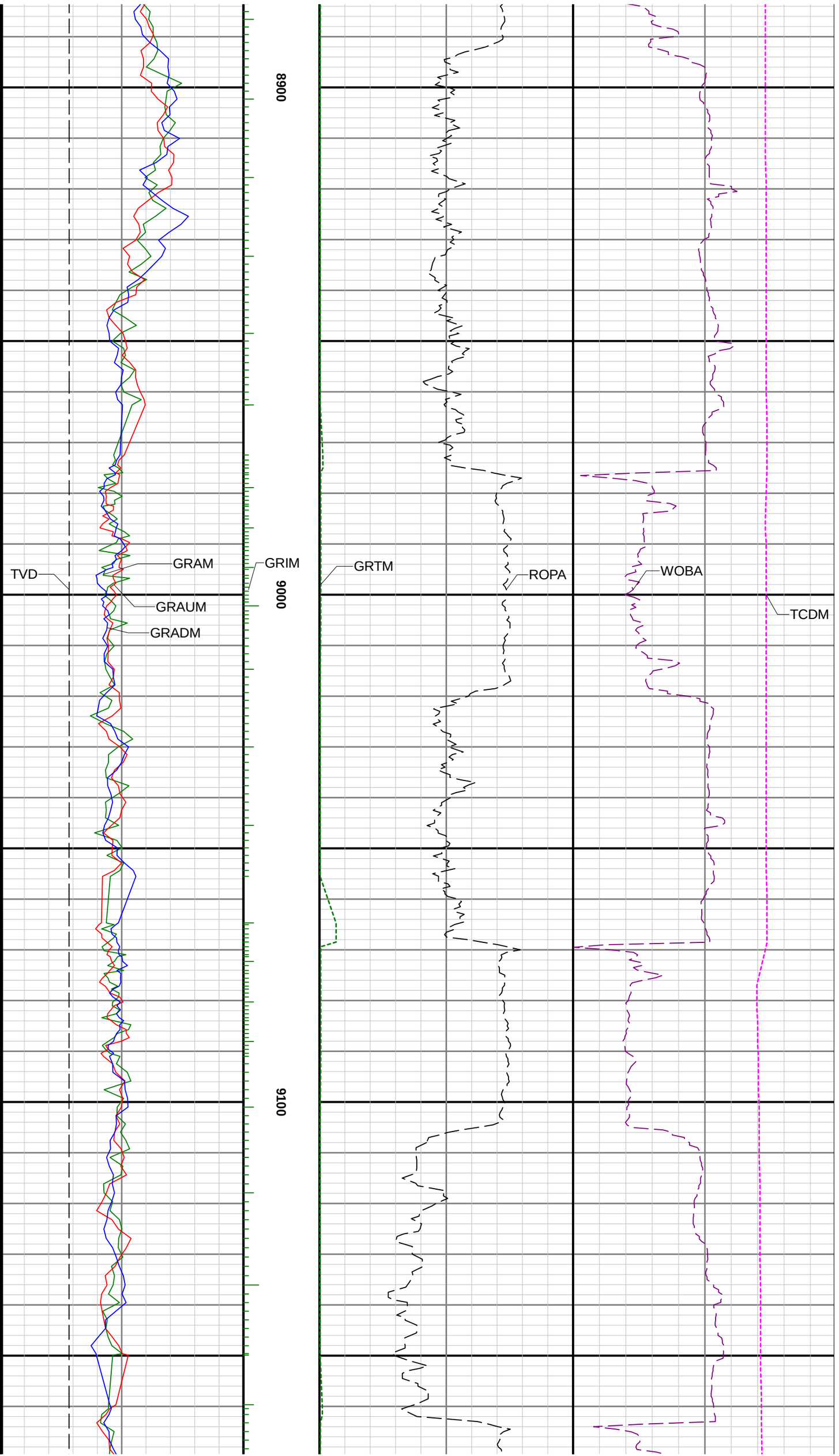
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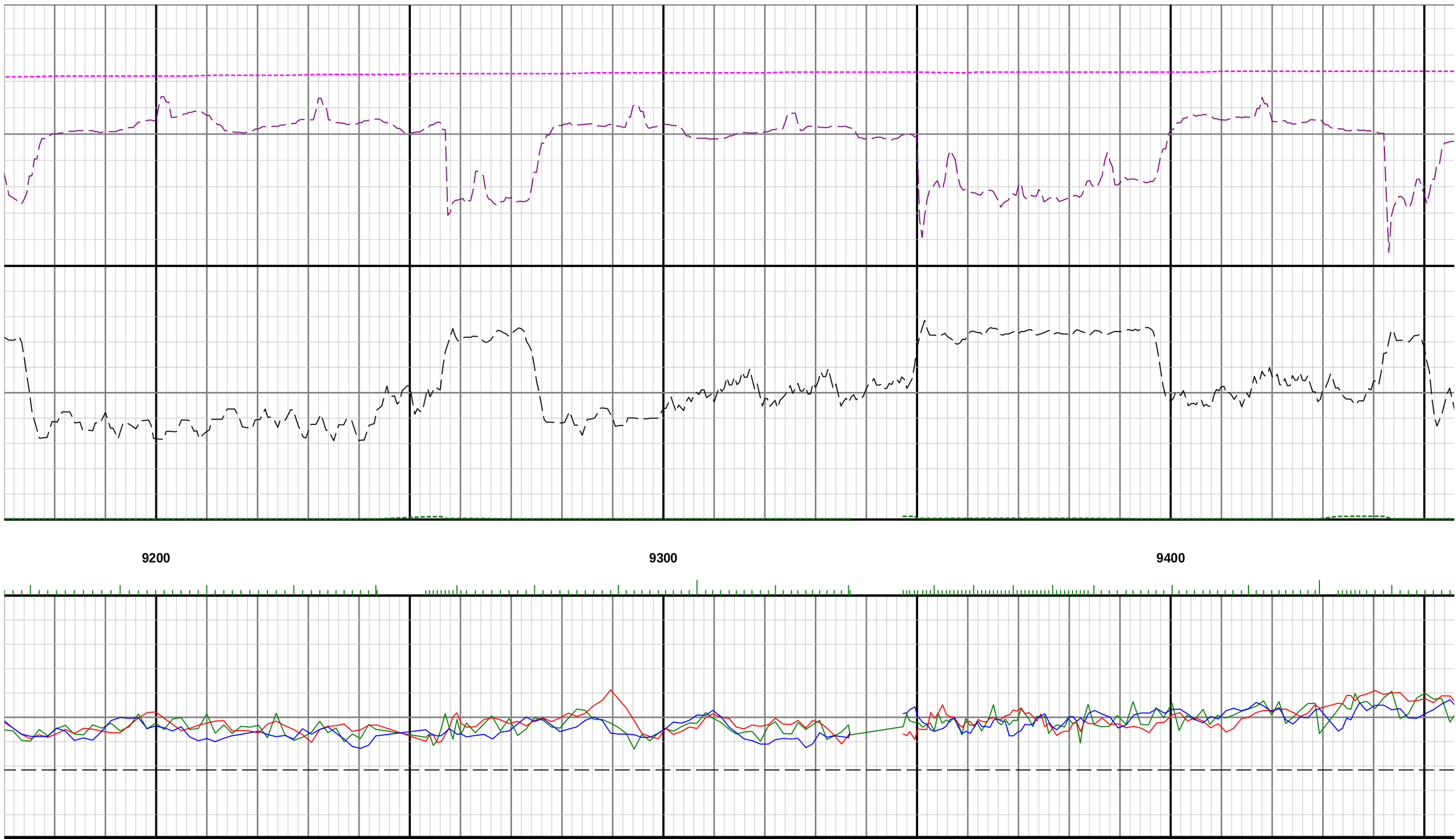
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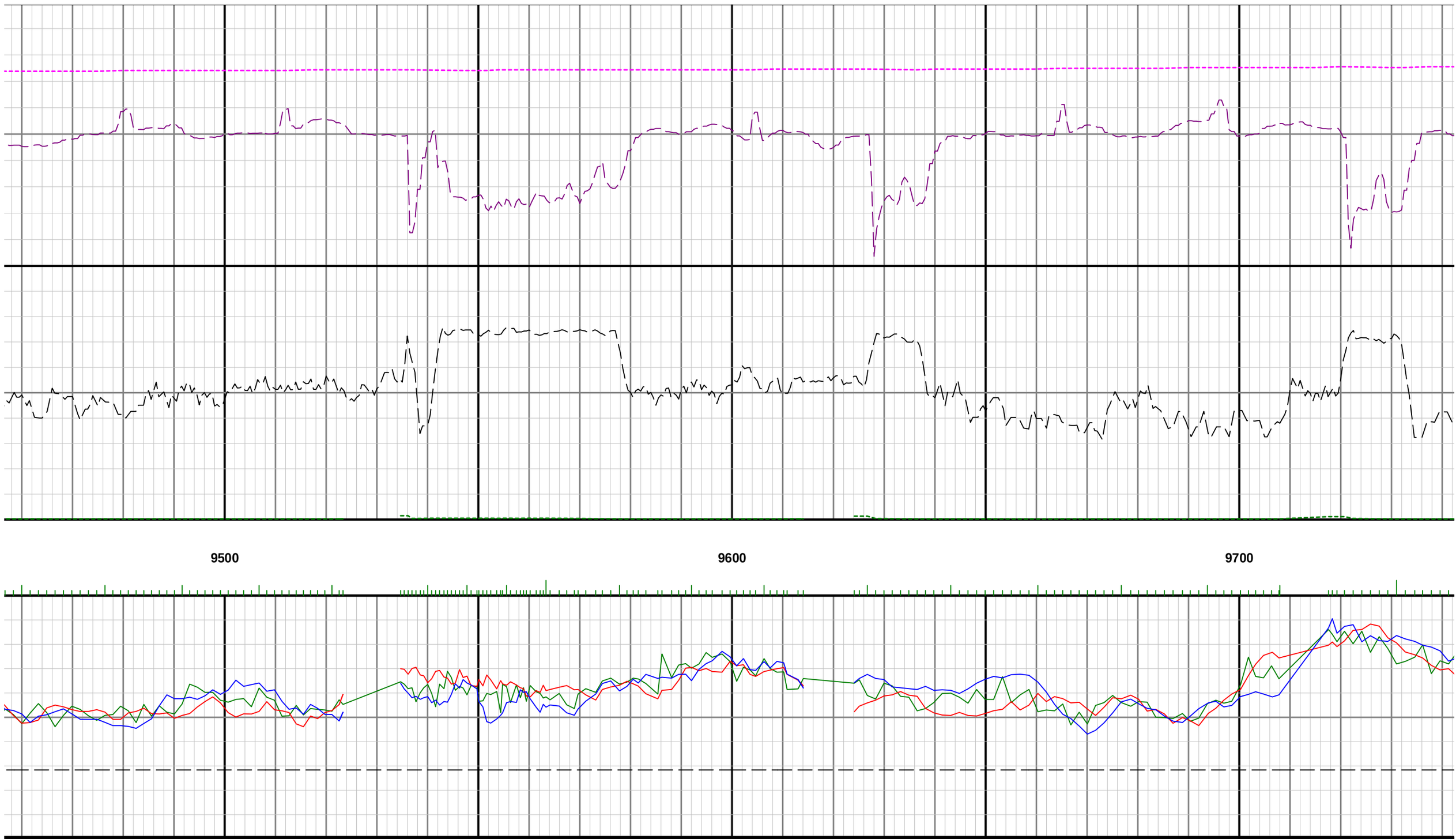
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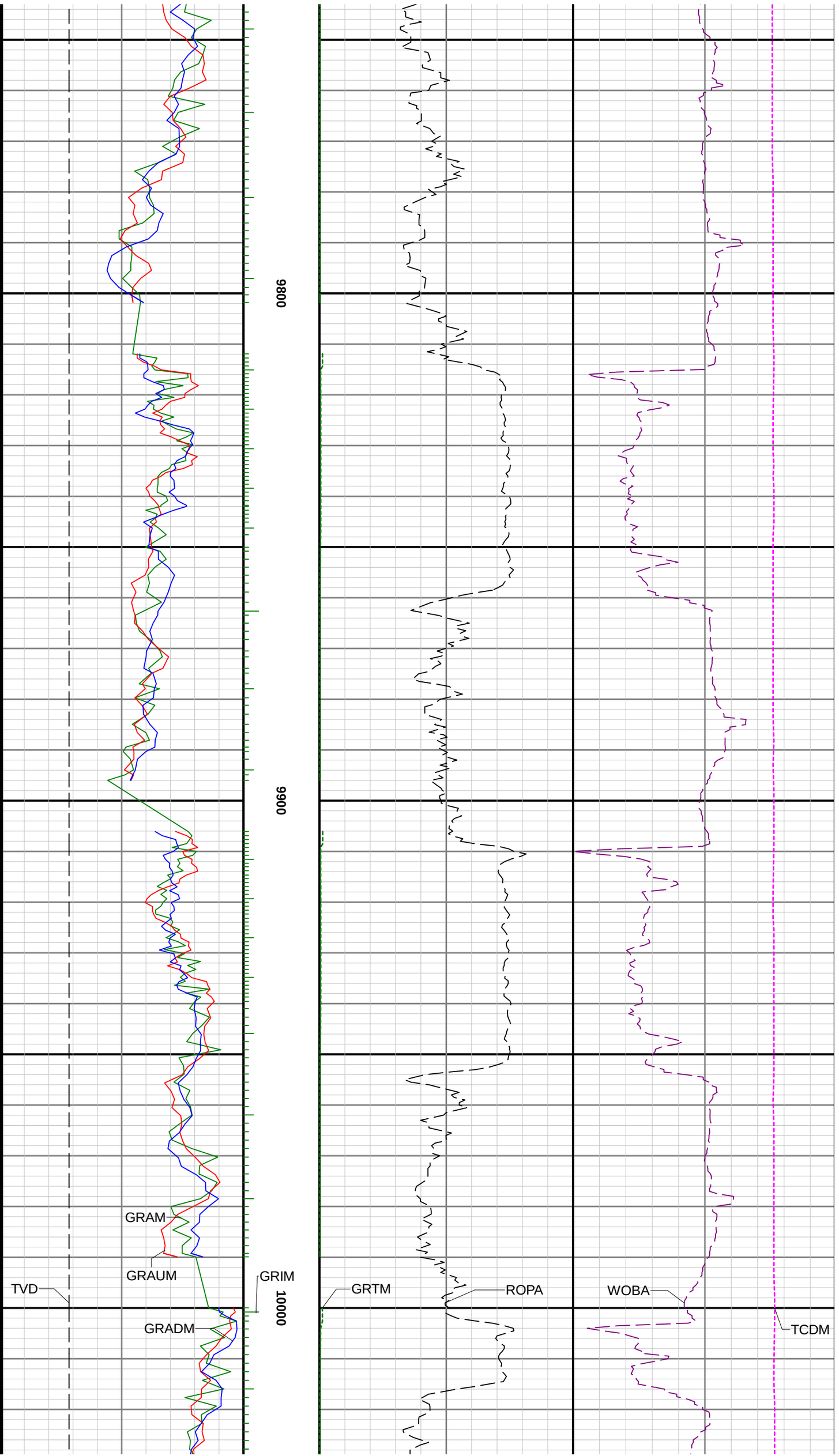
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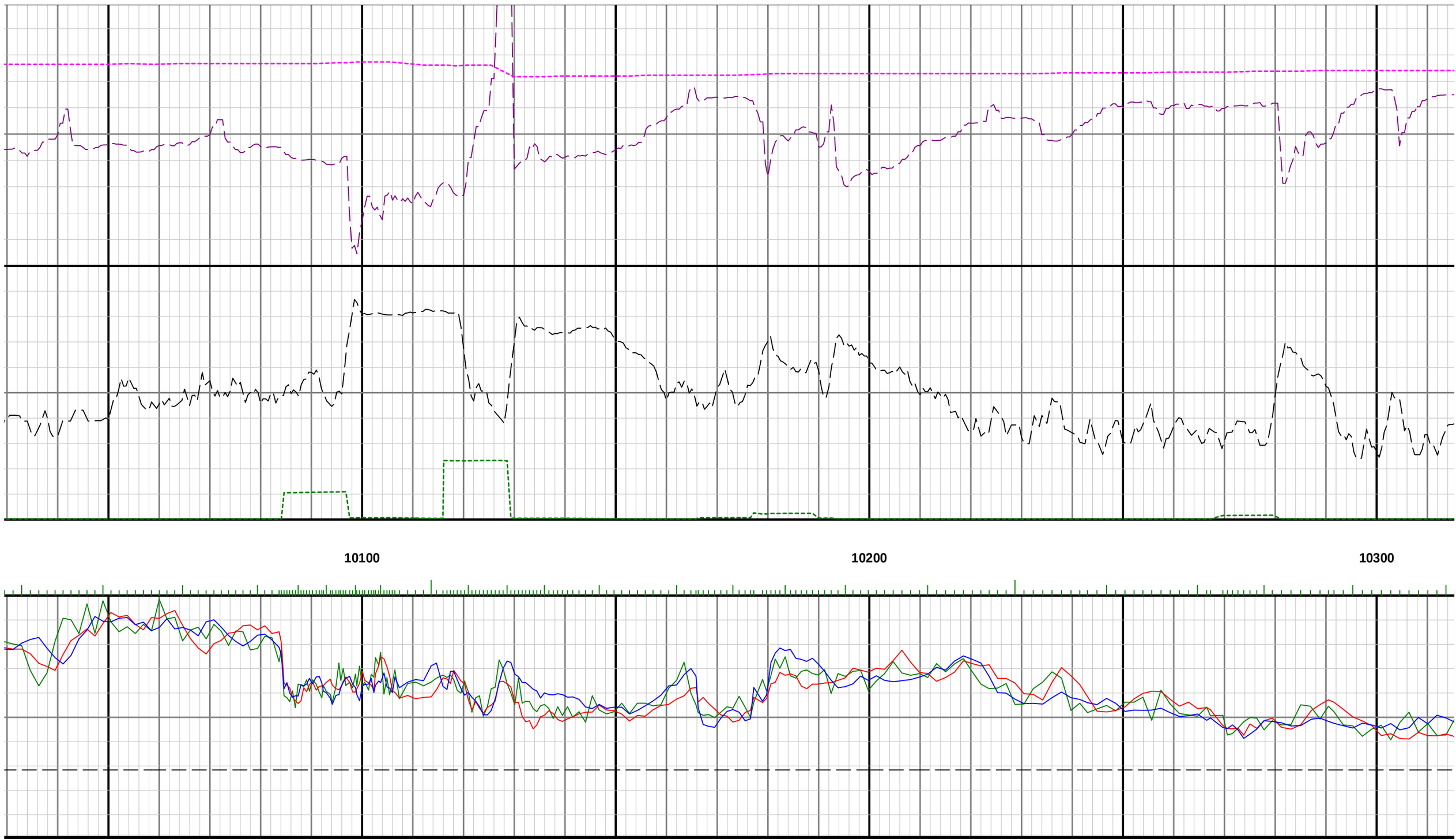
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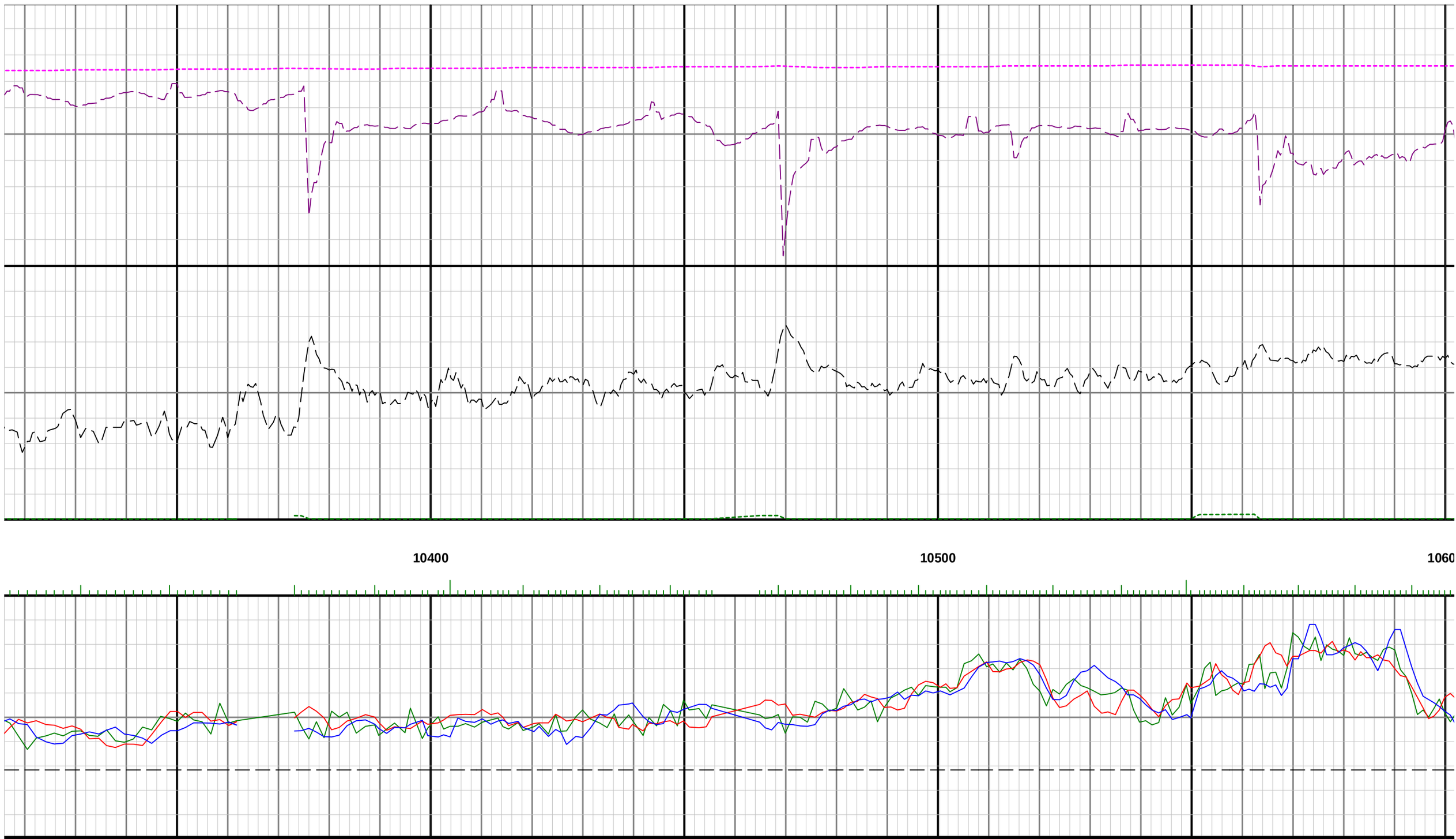
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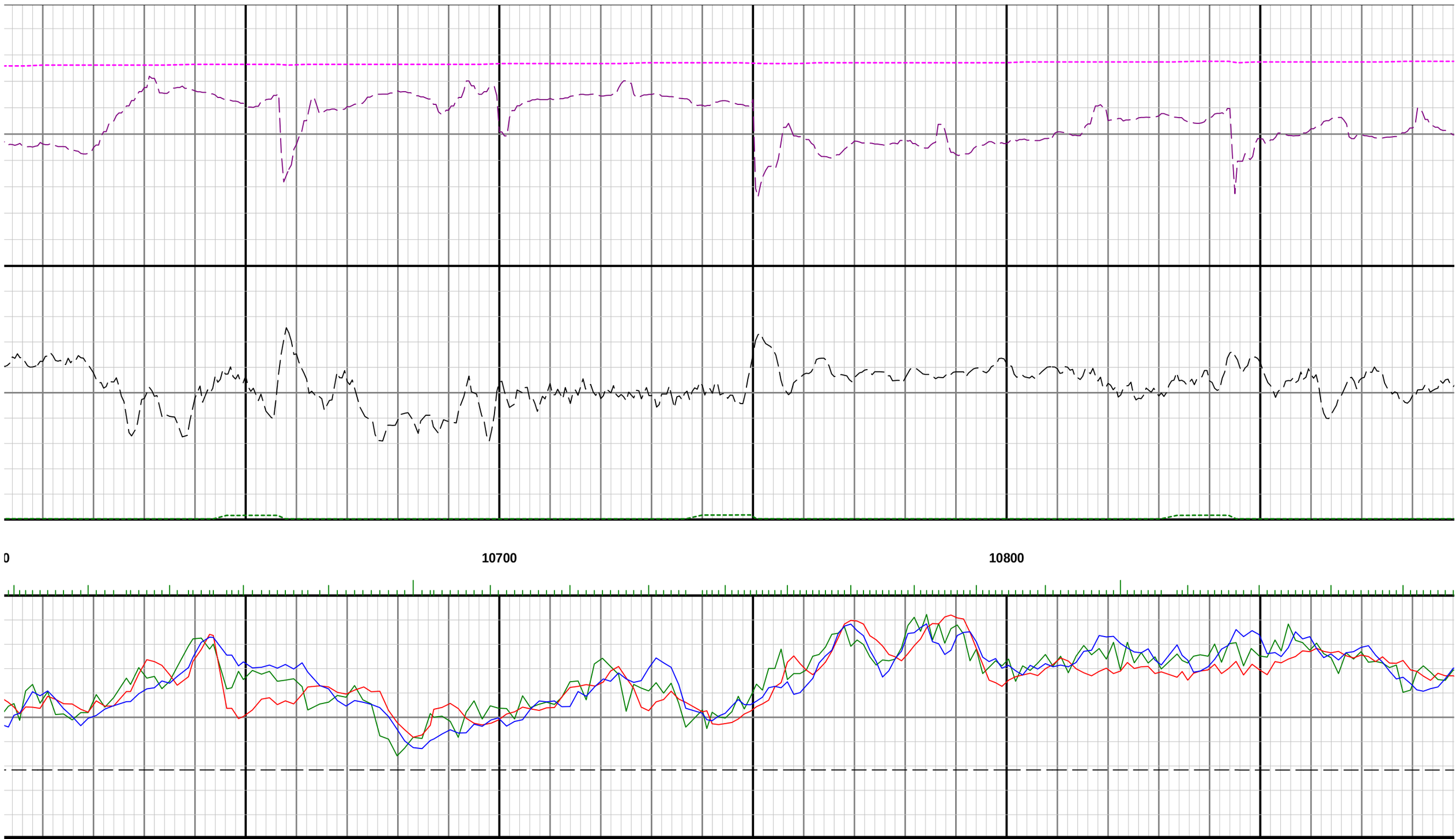
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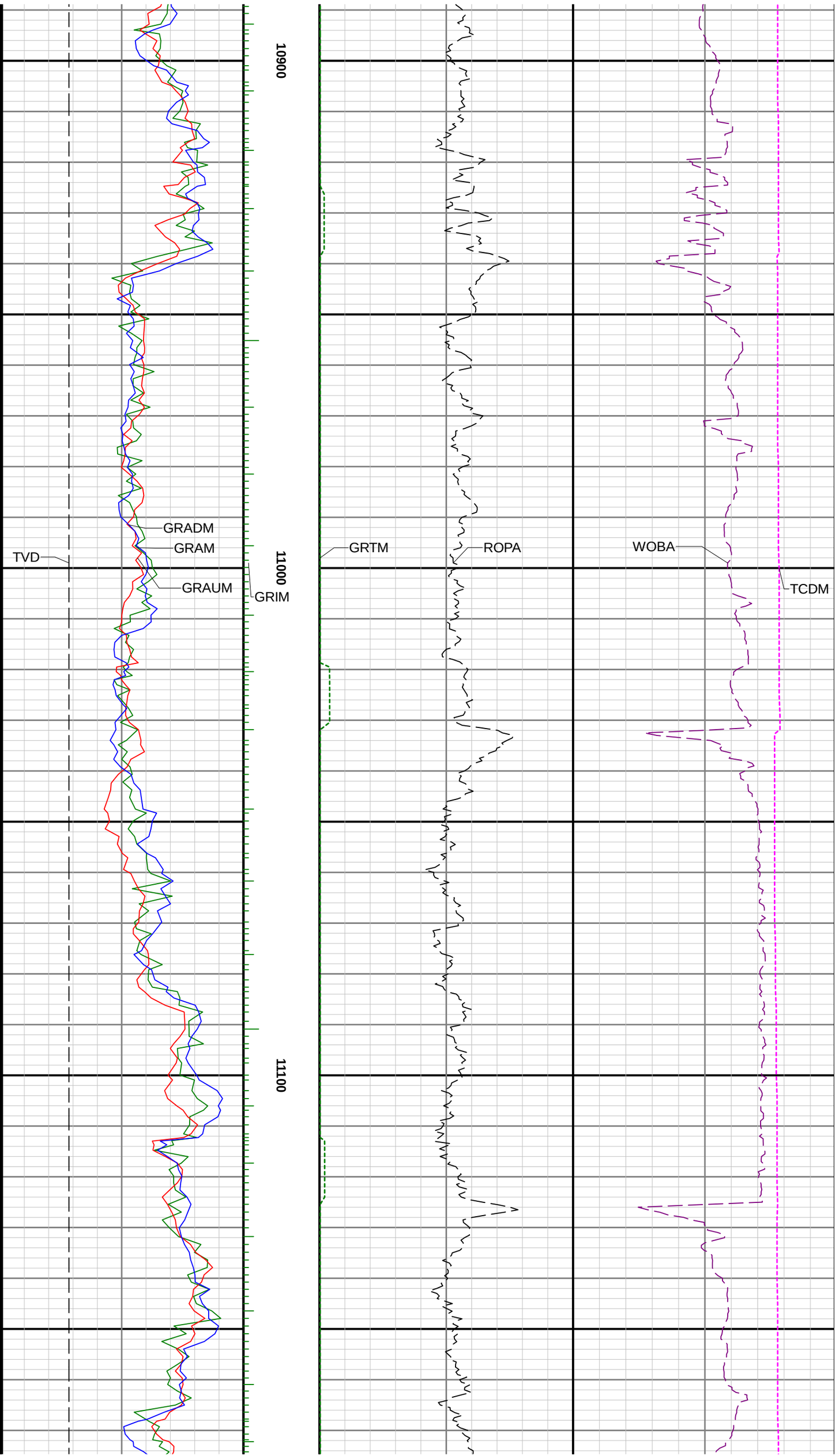
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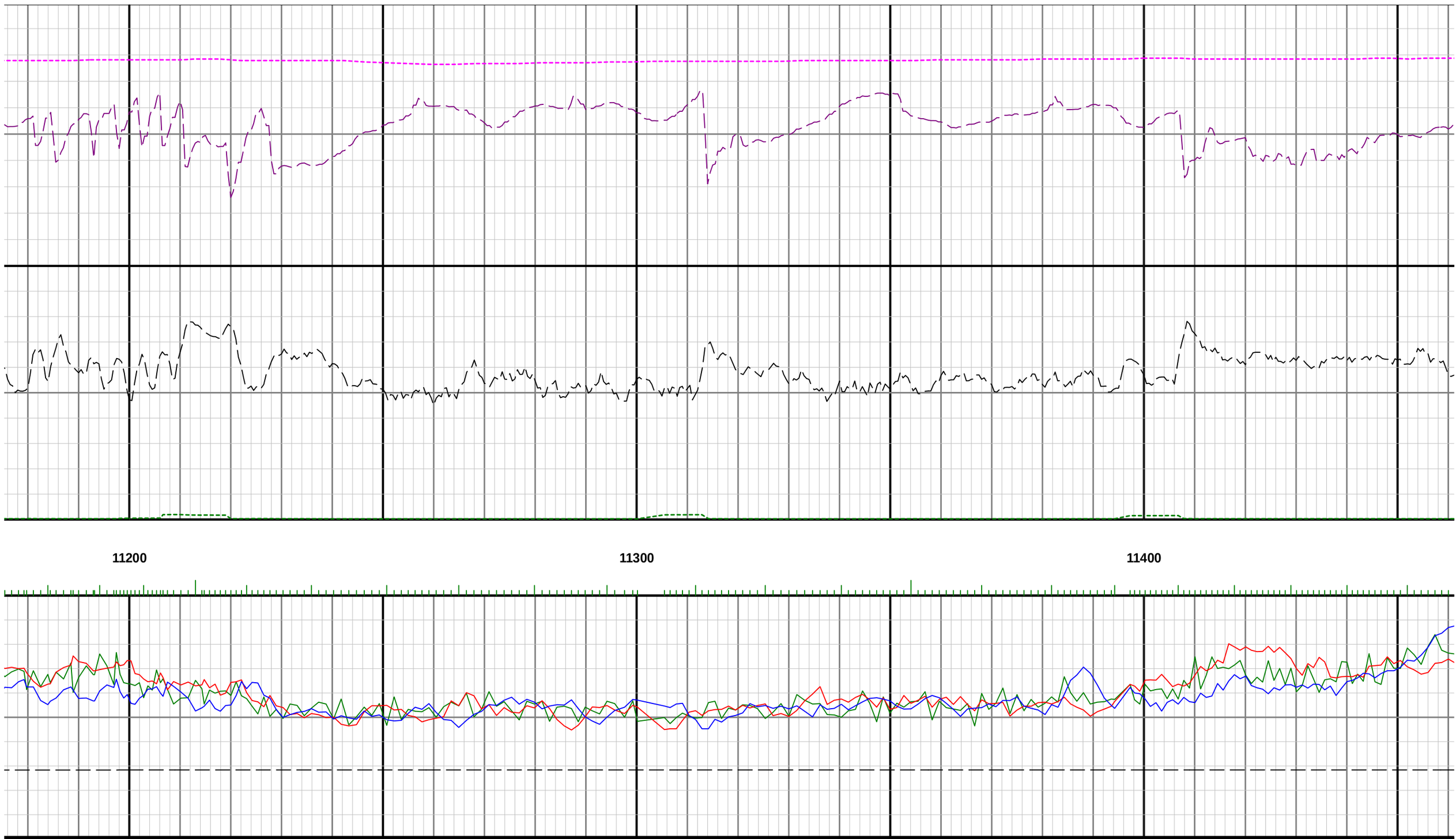
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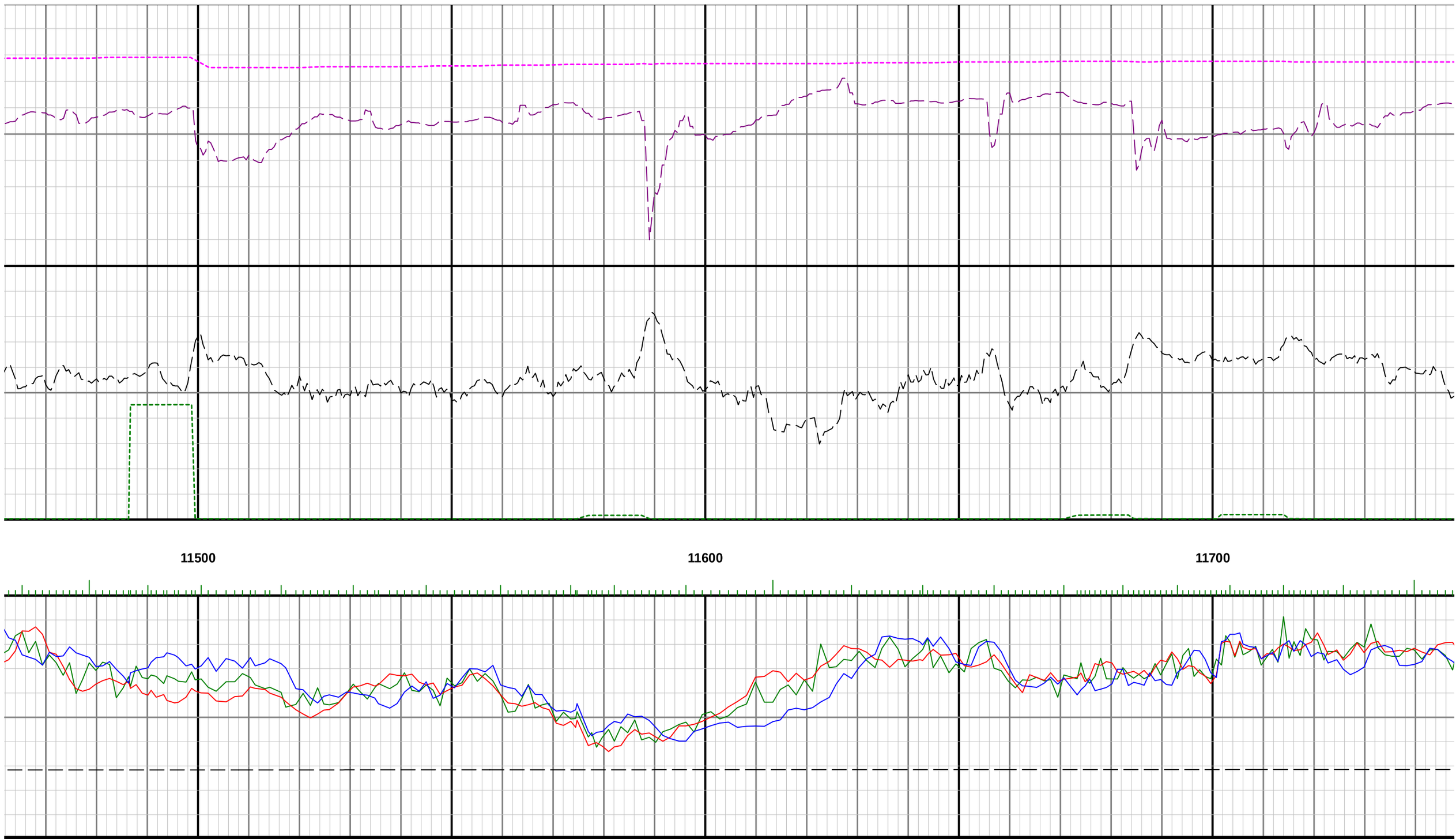
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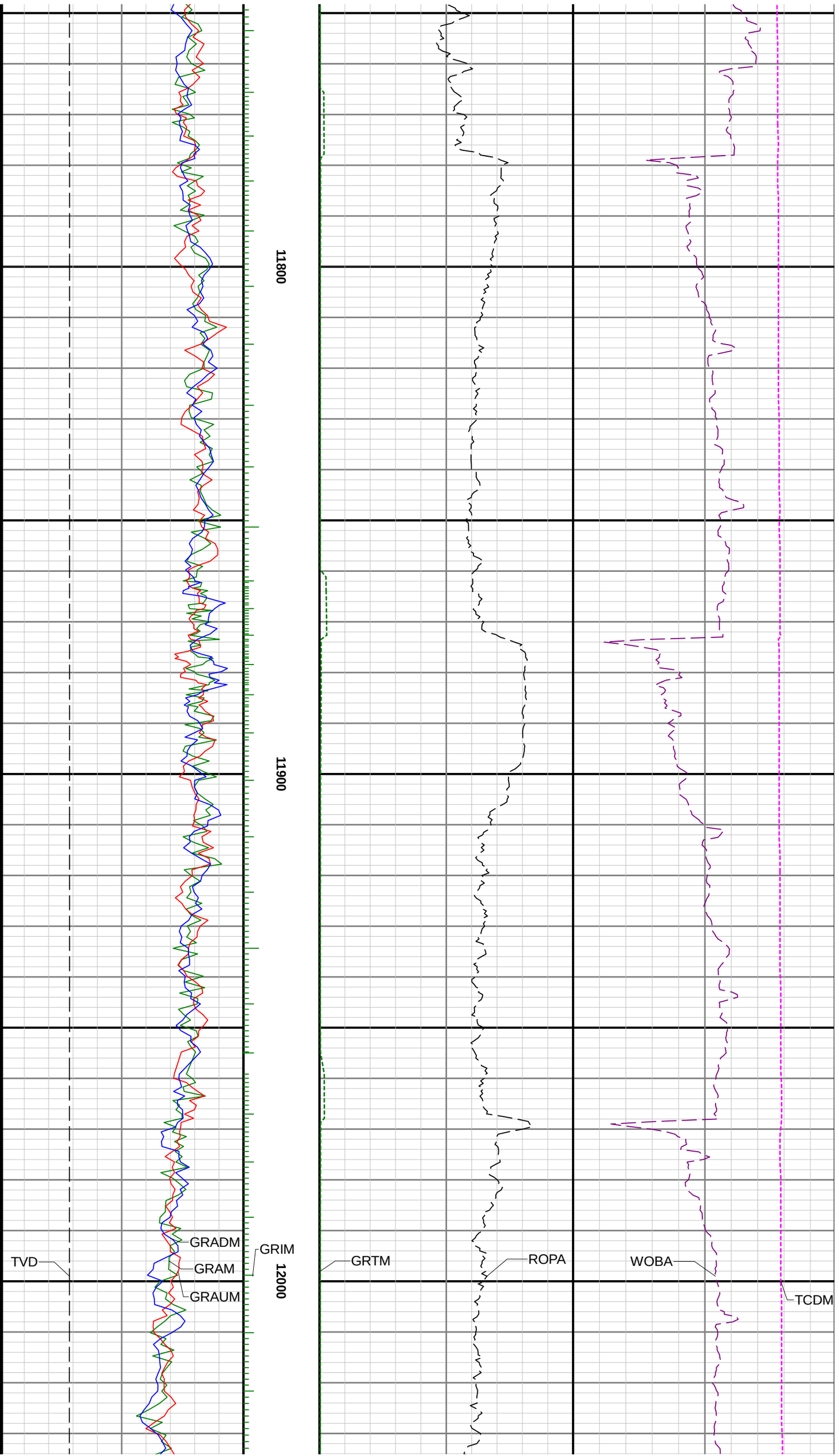
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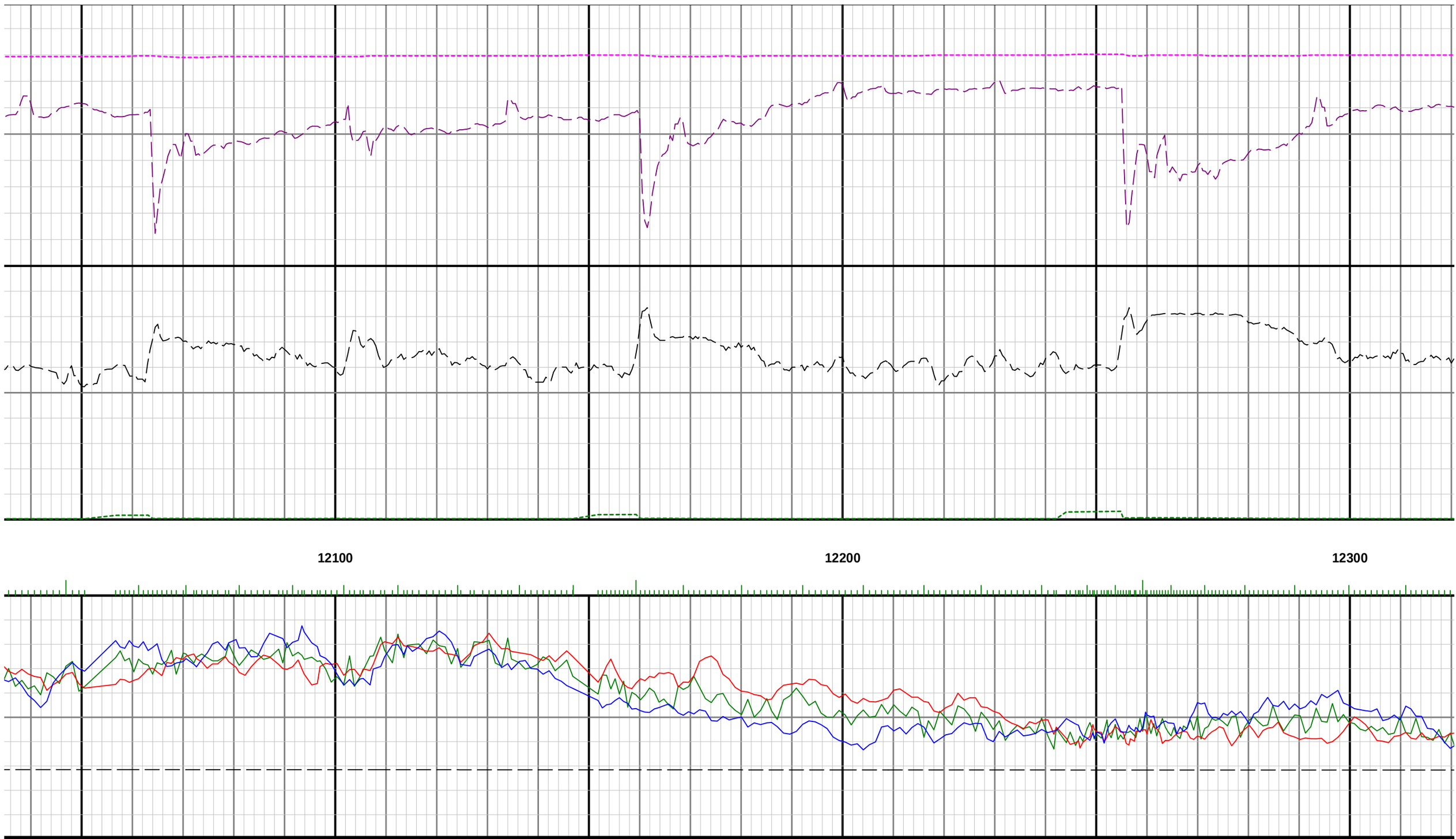
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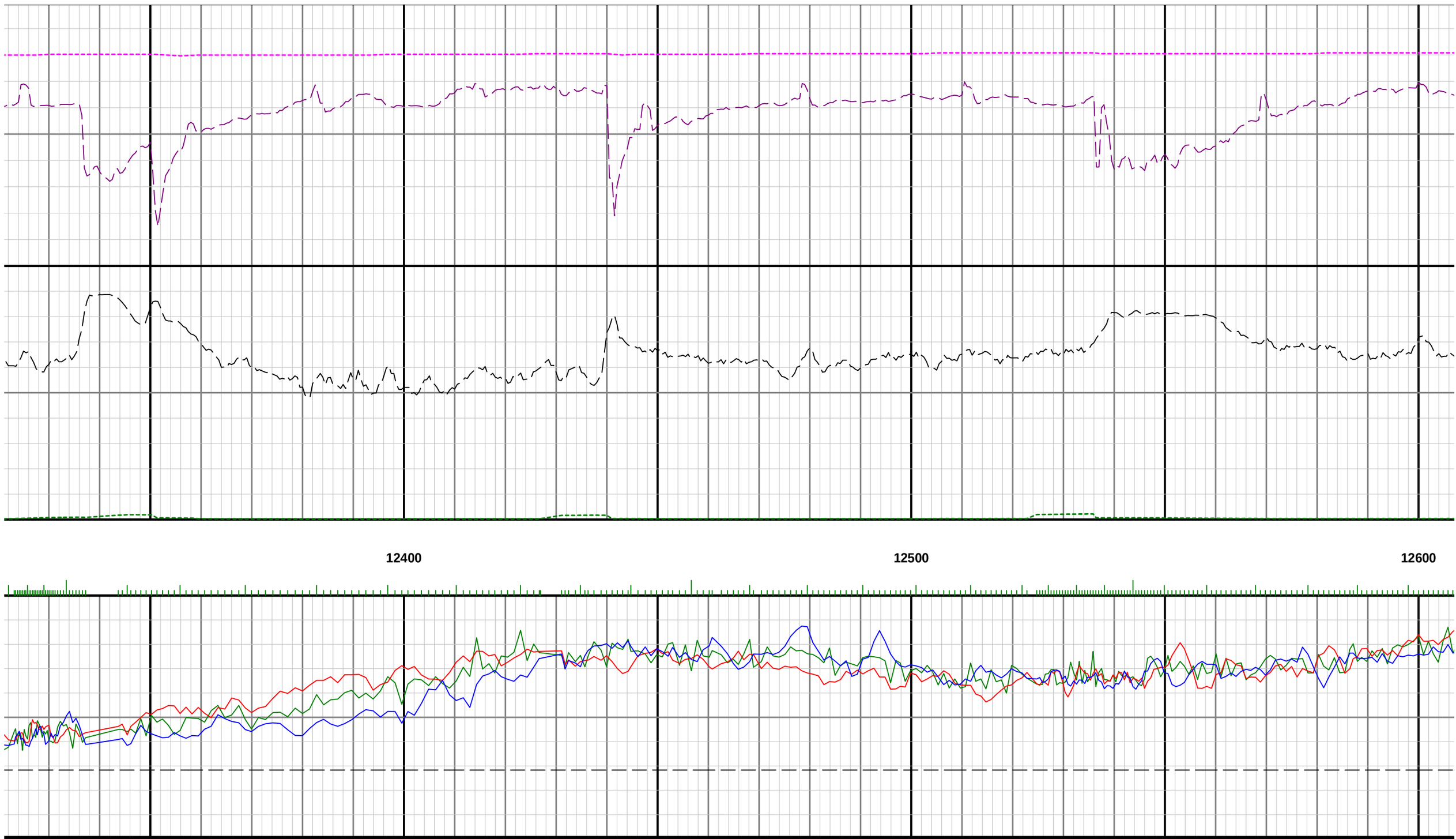
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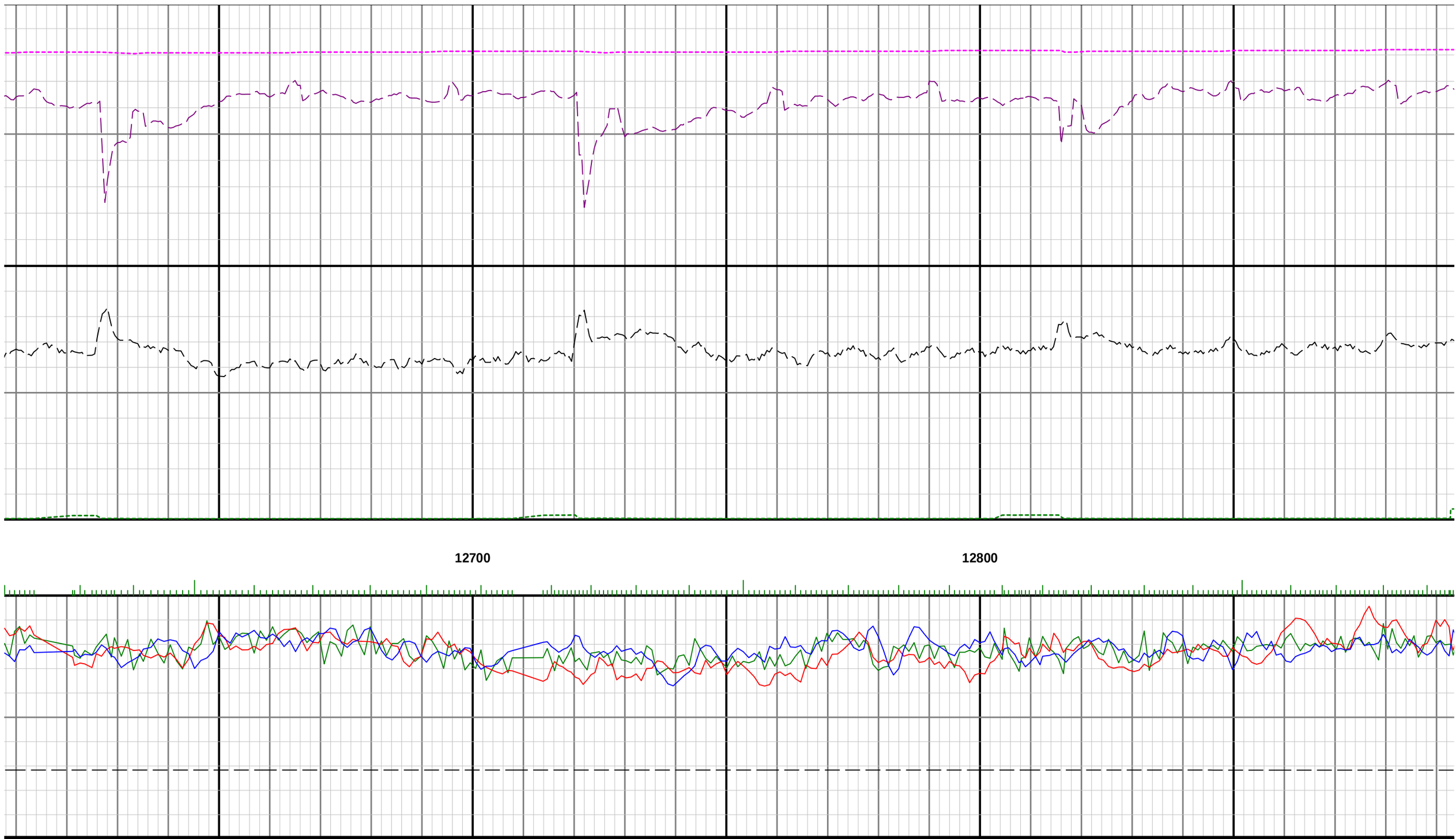
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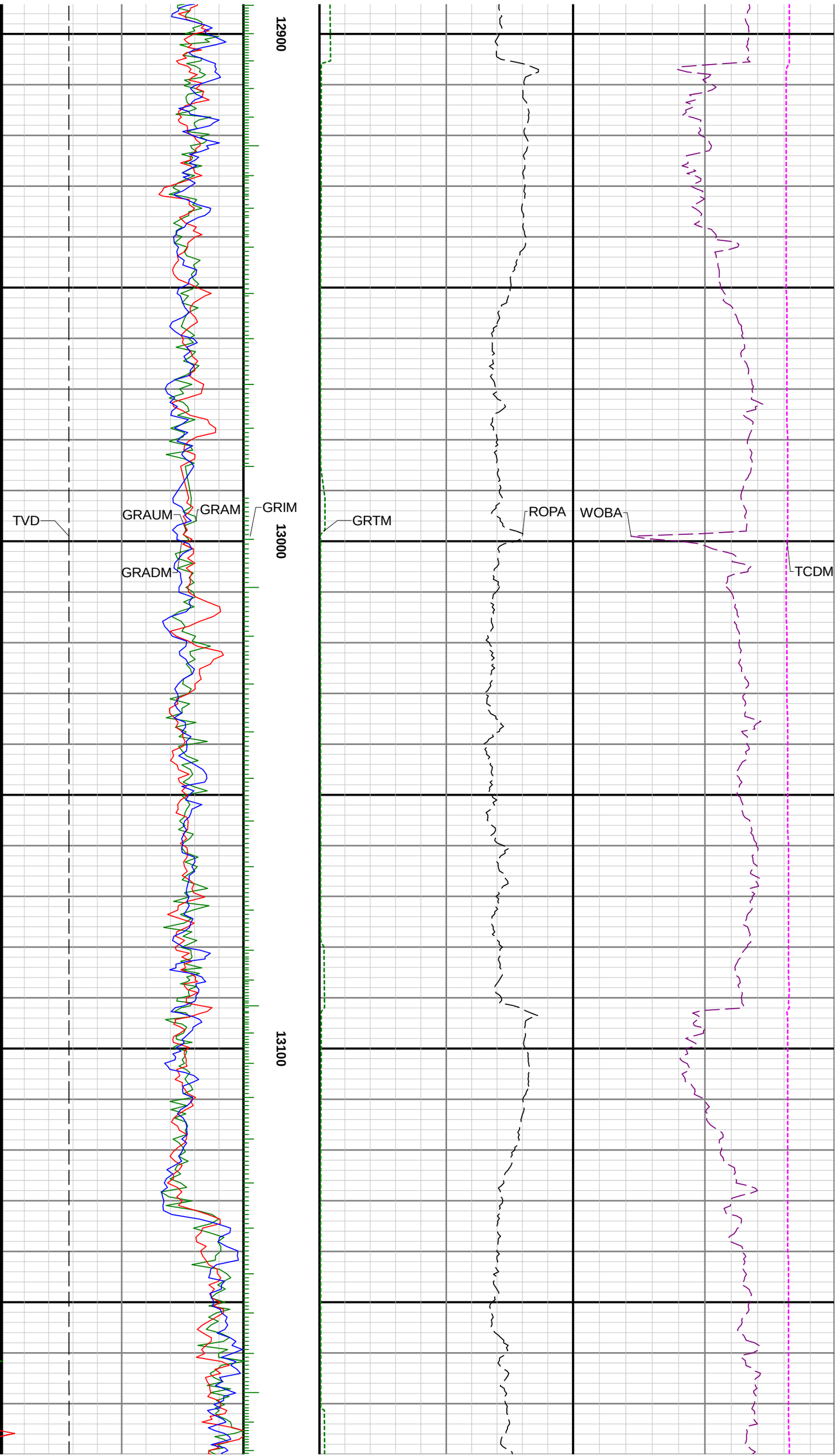
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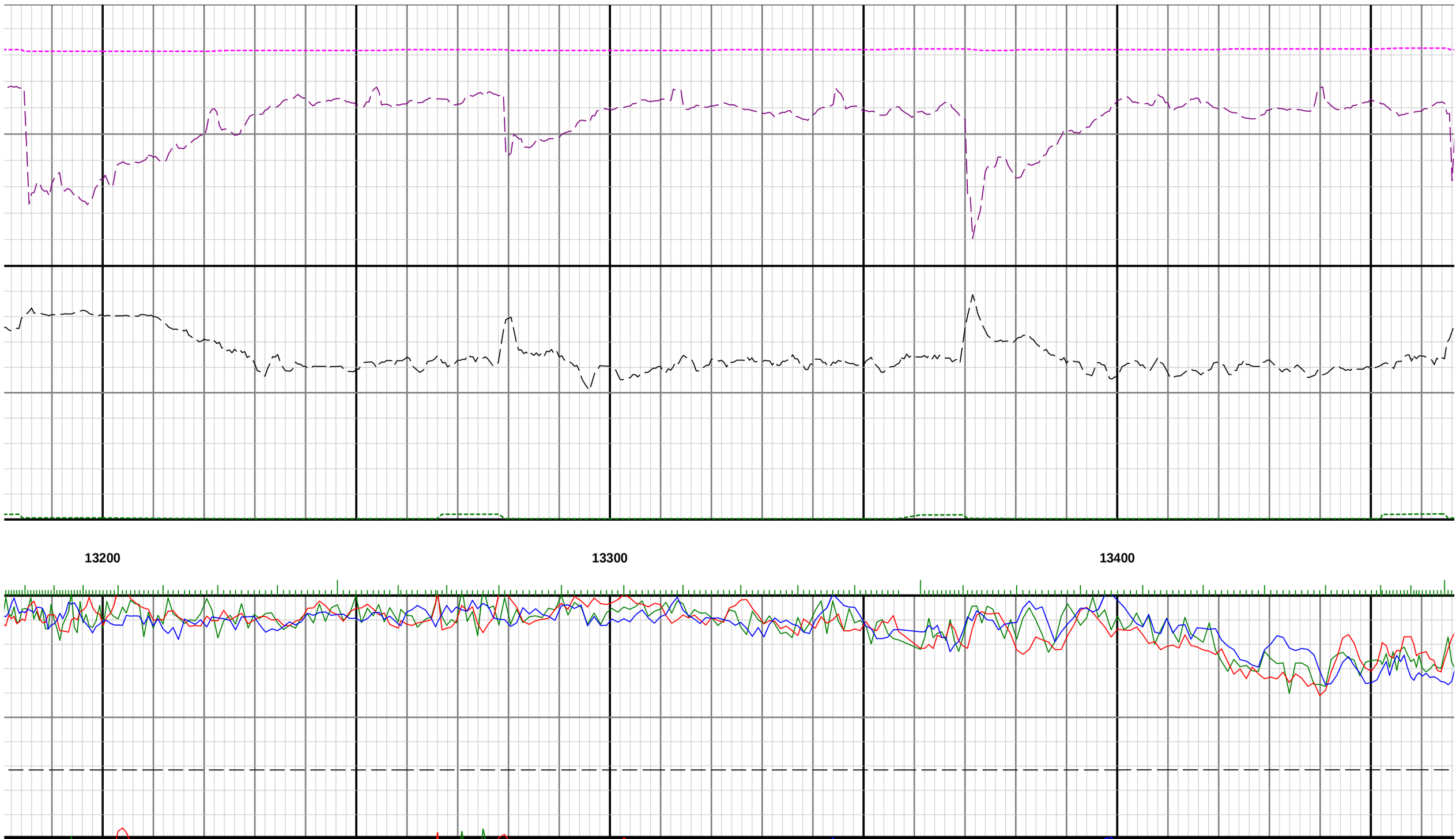
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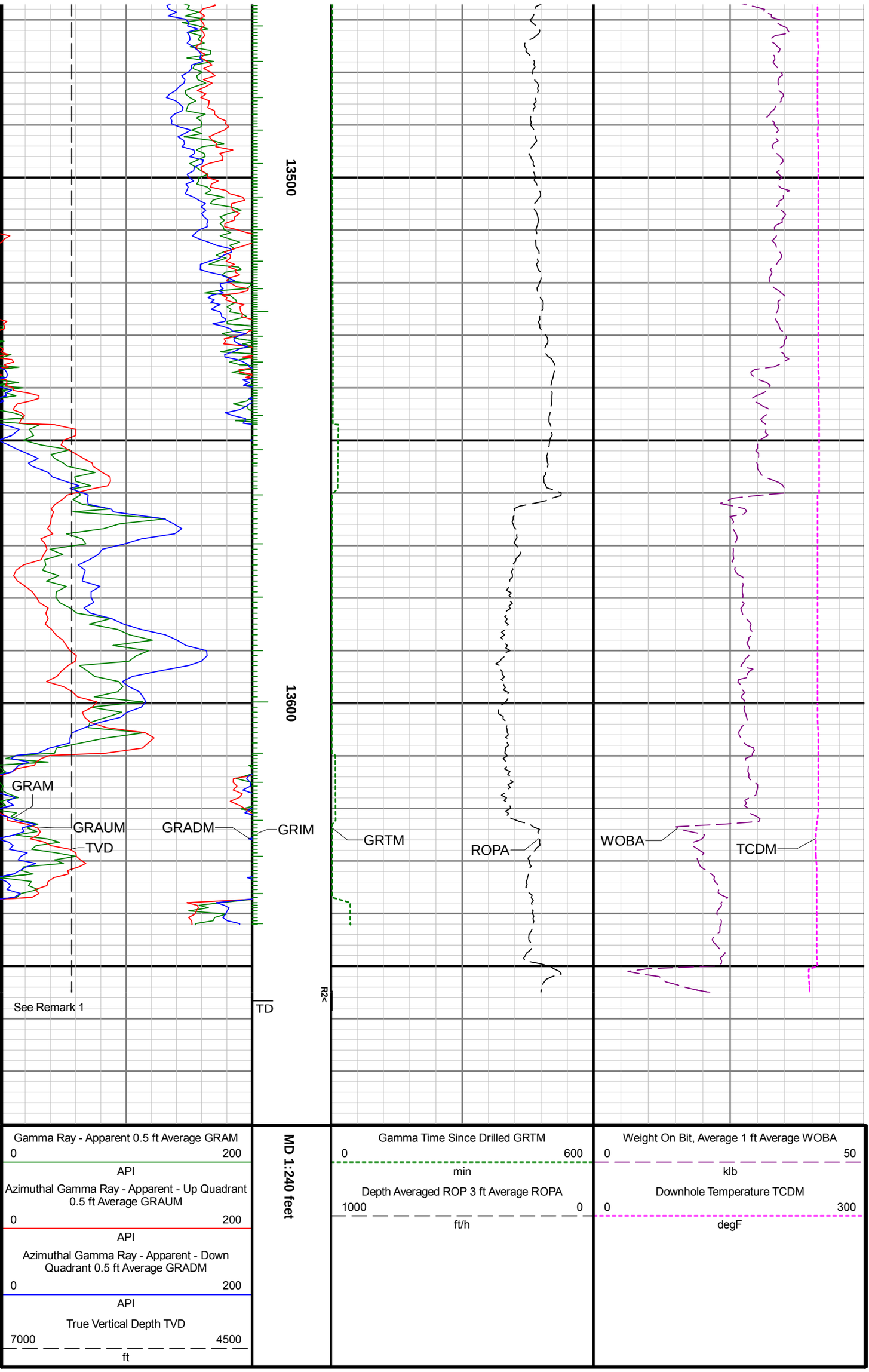

Gamma Ray - Apparent 0.5 ft Average GRAM
0 200
API
Azimuthal Gamma Ray - Apparent - Up Quadrant 0.5 ft Average GRAUM
0 200
API
Azimuthal Gamma Ray - Apparent - Down Quadrant 0.5 ft Average GRADM
0 200
API
True Vertical Depth TVD
7000 4500
ft

MD 1:240 feet

Gamma Time Since Drilled GRTM
0 600
min
Depth Averaged ROP 3 ft Average ROPA
1000 0
ft/h

Weight On Bit, Average 1 ft Average WOBA
0 50
klb
Downhole Temperature TCDM
0 300
degF