BAKER HUGHES

Memory / Realtime Log

Multiple Propagation Resistivity
Gamma Ray

Scale: 1:240 Measured Depth

Company: Anadarko

Well: Bydakek 28C-20HZ

Field: Weld County (Kerr McGee)

Region: Continental US **Country:** United States

Status: Final Print

API Number: 051233621200

Surface Location:
Latitude: 40° 7' 5.448" N
Longitude: 104° 41' 35.560" W
Section 20 TWN: 2N Range 65 W

Other Services:
2 Sector Gamma Ray
Directional
VSS

Permanent Datum (P.D.):	Ground Level	Elevation:	4944.00 ft.
Log Measured From:	Rig Floor	13.00 ft.	Above P.D.
Depth Reference:	Driller's Depth		

Elevations:
KB: N/A
DF: 4944.00 ft.
GL: 4931.00 ft.

Interval Logged		Dates		Magnetic Field Reference			
Top:	6820 ft.	Date From:	09/Apr/13	Dip Angle:	66.83 °	Azi Reference North:	True
Bottom:	11991 ft.	Date To:	13/Apr/13	Total		Mag to Reference	
		Spud Date:	06/Apr/13	Field Strength:	52920.8 nT	North Correction:	8.41 °

Borehole Record

Hole Size	From	To
13.500 in.	Surface	1012 ft.
8.750 in.	1012 ft.	7771 ft.
6.000 in.	7771 ft.	12039 ft.

Casing Record

Size	Weight	From	To
9.625 in.	36.00 lb/ft	Surface	1010 ft.
7.000 in.	26.00 lb/ft	Surface	7762 ft.

Mud Record

Type	From	To
Water Based – Fresh	6873 ft.	7771 ft.
Water Based – Fresh	7771 ft.	12039 ft.

Deviation Record

Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
8.750 in.	7771 ft.	0.1 ° / 254.3 °	84.6 ° / 1.1 °
6.125 in.	12039 ft.	84.6 ° / 1.1 °	90.1 ° / 358.1 °

Acquisition System	Software Version	Other	
Advantage	2.20U4	Rig: / Contractor:	Ensign 138 / Anadarko
PATS	6.4.1.34	Job No:	5257239
		District: / Unit:	Rocky Mountain / D&E

Log Run Summary

LWD Run No.	BHA Run No.	Bit Run No.	Bit Size (in.)	Bit Type	Bit Gauge Length (in.)	Assembly Type	Logged Interval Top (m.)	Logged Interval Bottom (m.)	Bit Depth Interval From (m.)	Bit Depth Interval To (m.)	Date / Time Start	Date / Time End	Circ. Time (hrs.)
1	1	1	8.750	PDC	2.500	Steerable	N/A	N/A	1012	6873	07/Apr/2013 11:00	08/Apr/2013 20:39	29.8
2	2	2	8.750	PDC	2.500	Steerable	6820	7724	6873	7771	09/Apr/2013 09:12	10/Apr/2013 04:40	19.3
3	3	3	6.125	PDC	2.500	Steerable	7724	11991	7771	12039	11/Apr/2013 13:20	13/Apr/2013 18:00	31.7

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Will Drake	7 Apr 2013	13 Apr 2013	York Lewis	7 Apr 2013	12 Apr 2013	Bill Herbers	7 Apr 2013	13 Apr 2013
Robert Keagan Lea	7 Apr 2013	13 Apr 2013	Matt Yule	12 Apr 2013	13 Apr 2013			

Mud Properties Record

Date / Time	LWD Run No.	Measured Depth (m.)	Mud Type	Density (sg)	Viscosity (cp)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
08/Apr/2013 21:35	1	6873	Water Based – Fresh	9.6	N/A	N/A	N/A	0 / 100	Active Mud Pit	2300	0.0
09/Apr/2013 03:39	2	6873	Water Based – Fresh	8.4	2	9.0	0.0	0 / 100	Active Mud Pit	1400	0.0
10/Apr/2013 06:24	2	7773	Water Based – Fresh	9.8	12	8.8	0.0	0 / 100	Active Mud Pit	2300	0.0
11/Apr/2013 21:04	3	7773	Water Based – Fresh	9.8	12	8.8	0.0	0 / 100	Active Mud Pit	2300	0.0
12/Apr/2013 03:31	3	10655	Water Based – Fresh	9.4	10	9.5	0.0	0 / 100	Active Mud Pit	2500	0.0

Mnemonics

Curve	Description	Units
CACLX	Conductivity Attenuation – Corrected – 2MHz	mmho/m
GRAM	Gamma Ray Apparent, – 0.5 ft. Avg.	API
GRAX	Gamma Ray Apparent, – 0.5 ft. Avg.	API
GRIM	Gamma Ray Data Density	Points
GRIX	Gamma Ray Data Density	Points
RACHM	Resistivity Attenuation – Corrected – 2 MHz	Ohm.m
RACLM	Resistivity Attenuation – Corrected – 400 KHz	Ohm.m
ROPA	Rate of Penetration, 3.0 ft. Avg.	ft/hr
RPCLM	Resistivity Phase – Corrected – 400 KHz	Ohm.m
RPCHM	Resistivity Phase – Corrected – 2 MHz	Ohm.m
RPSIHM	Resistivity Sliding Indicator	unitless
RPTHM	Resistivity Time Since Drilled	min

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (m.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	11941434	Directional	57.90	6.750	2.250
1	SRIG	12673191	Gamma	54.53	6.750	2.250
2	DIR	11941434	Directional	51.69	6.750	2.250
2	SRIG	12673191	Gamma	48.32	6.750	2.250
3	CS	10568764	-	82.24	4.810	1.750
3	BCPM	11912014	Telemetry	71.23	5.010	1.750
3	STAB	10497476	-	68.11	5.340	1.750
3	OTK	10510217	Directional	62.97	4.843	2.569
3	OTK	10510217	Resistivity	57.00	4.843	2.569
3	APR	10510217	Resistivity	57.00	4.980	1.750
3	OTK	10510217	Gamma	49.81	4.843	2.569
3	OTK	10510217	Pressure	52.44	4.843	2.569
3	CS	10388981	-	45.90	4.990	1.750

Service and Tool Mnemonics

Mnemonic	Name	Description
BCPM	BCPM	Mud pulse telemetry and downhole tool power module
DIR	Directional	Wellbore directional survey
OTK	OnTrak	Propagation resistivity, propagation conductivity, gamma ray, directional, annular pressure, system memory and VSS
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module
STAB	Stabilizer	Stabilizer assembly
CS	Closure Sub	BHA power ring isolator allowing insertion of inert sub into electrically powered BHA

Comments

1) Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to the lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.

2) Baker Hughes run 1 utilized 6 3/4 inch NaviTrak services (Directional only) behind an 8 3/4 inch bit and rotary steerable assembly from 1012 to 6873 feet MD (1012 to 6701 feet TVD).

3) Baker Hughes run 2 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 3/4 inch bit and rotary steerable assembly from 6873 to 7771 feet MD (6701 to 7301 feet TVD).

4) Baker Hughes run 3 utilized 4 3/4 inch OnTrak services (Multiple Propagation Resistivity, 2 sector Azimuthal Gamma Ray, Gamma Ray, and Directional) behind a 6 1/8 inch bit and steerable assembly from 7771 to 12039 feet MD (7301 to 7294 feet TVD).

5) The interval from Surface to 6873 feet MD (6701 feet TVD) was not logged due to directional only services being provided through the vertical hole section for Baker Hughes run 1.

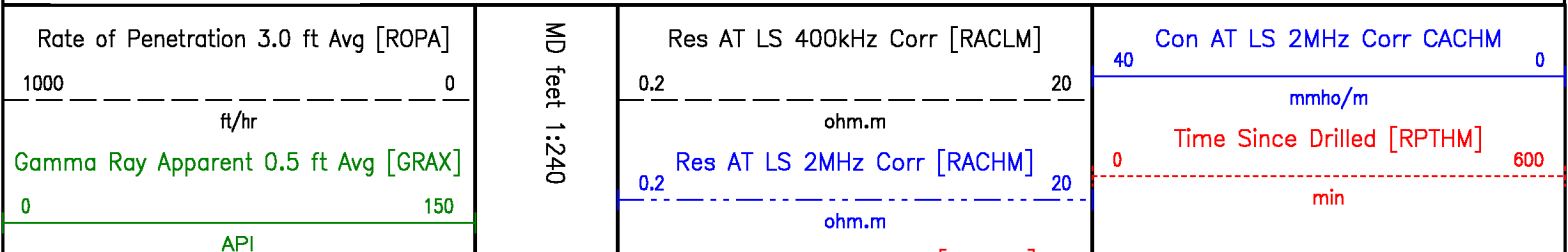
6) A sliding indicator is shown on the right side of track 2 as a heavy line. This indicator has been depth shifted to the resistivity sensor offset to correspond with resistivity data acquired while sliding.

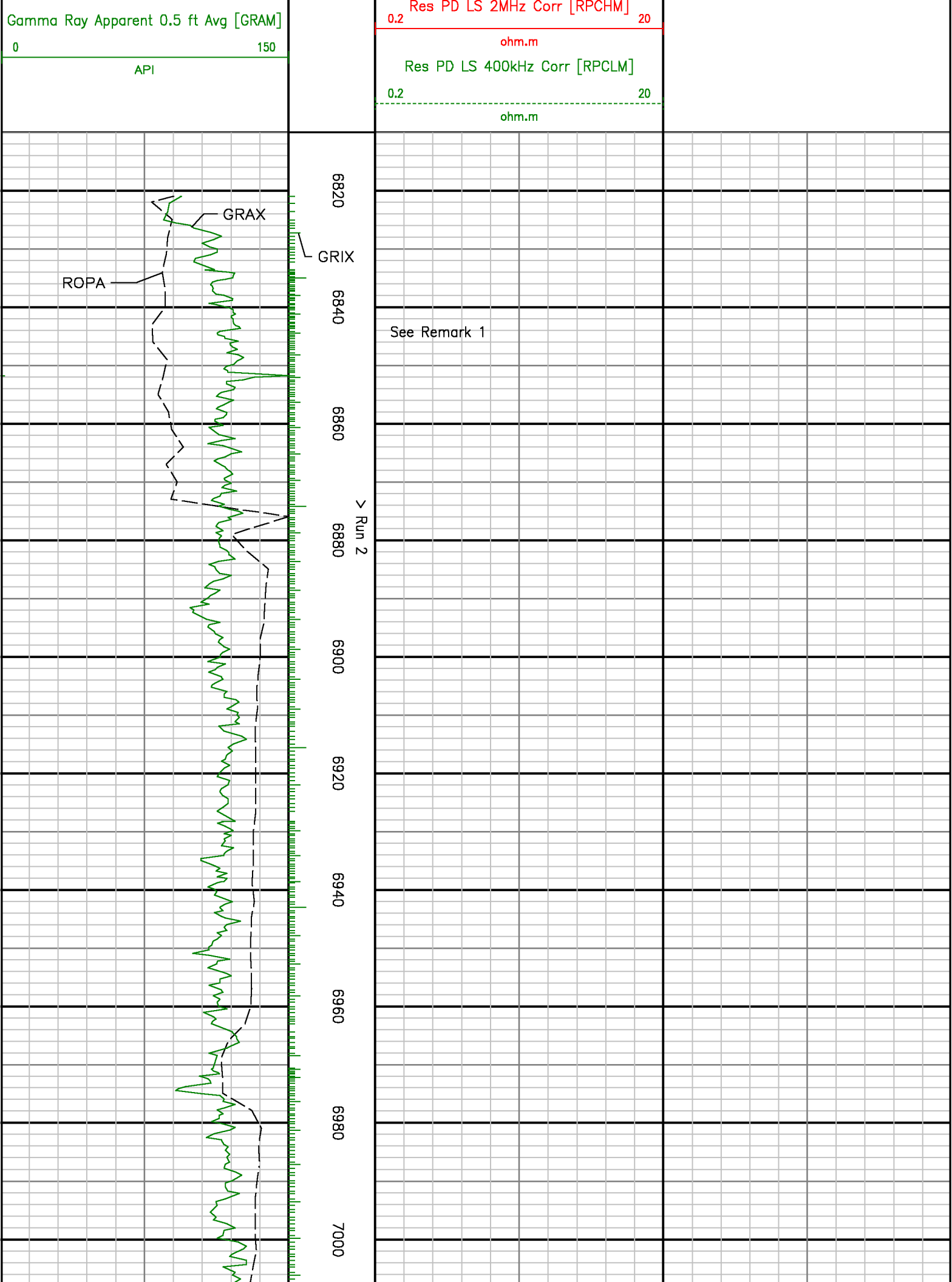
Remarks

Number	Measured Depth (m.)	Hole Section (in.)	LWD Run No.	Remark
1	6820	8.750	2	Begin logging services due to directional only services being provided through vertical hole.
2	12039	6.125	3	No gamma data due to bit-to-sensor offset.

BAKER HUGHES

Company : Anadarko
Well : Bydakek 28C-20HZ
Interval : 6810.00 - 12050.00 feet
Created : 13/Apr/2013 5:23:30 PM




Gamma Ray Apparent 0.5 ft Avg [GRAM]
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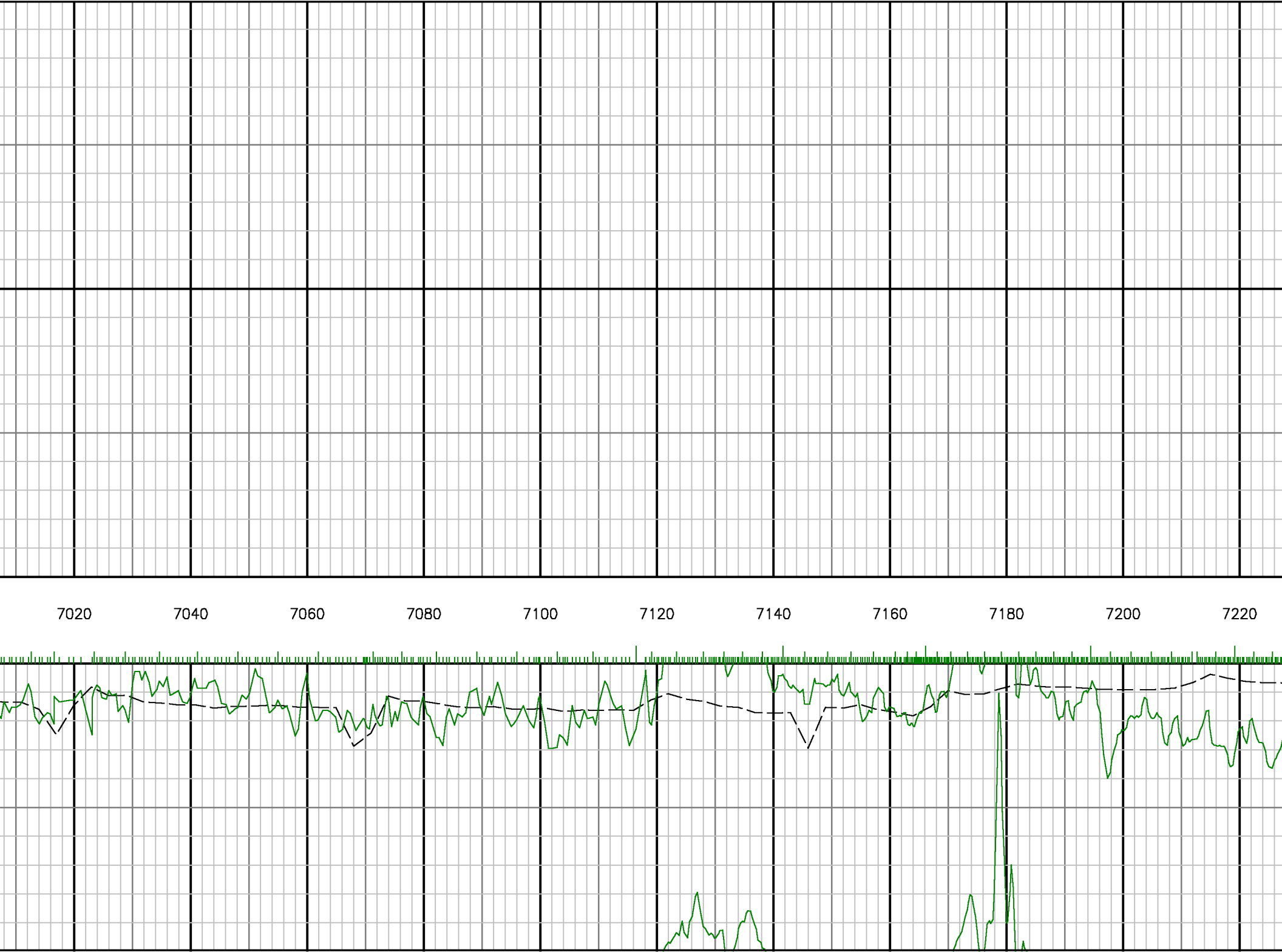
150
API
Res PD LS 2MHz Corr [RPCHM]
0.2
20
ohm.m
Res PD LS 400kHz Corr [RPCLM]
0.2
20
ohm.m
GRAX
GRIX
ROPA
See Remark 1
6820
6840
6860
6880
6900
6920
6940
6960
6980
7000
> Run 2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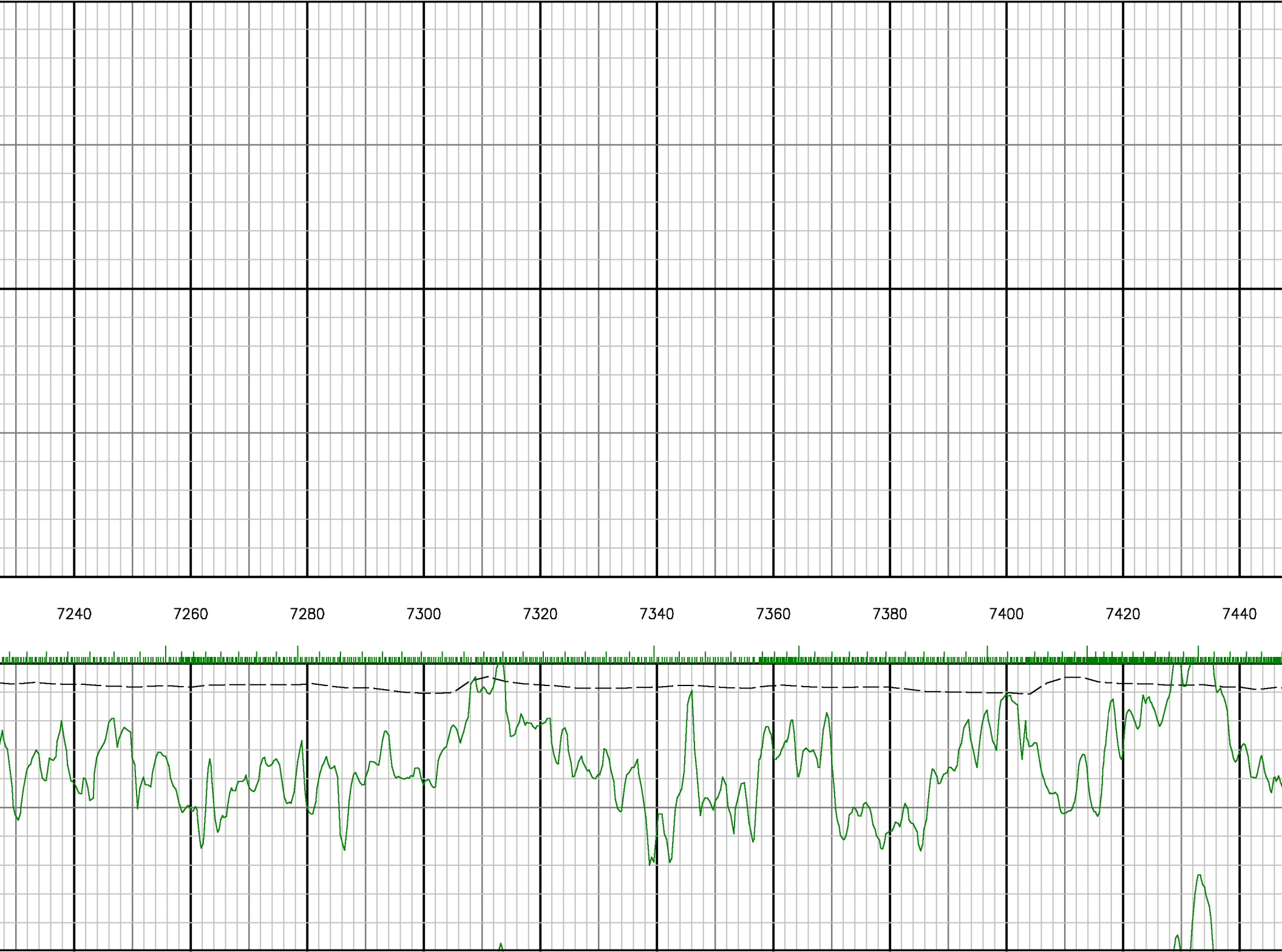
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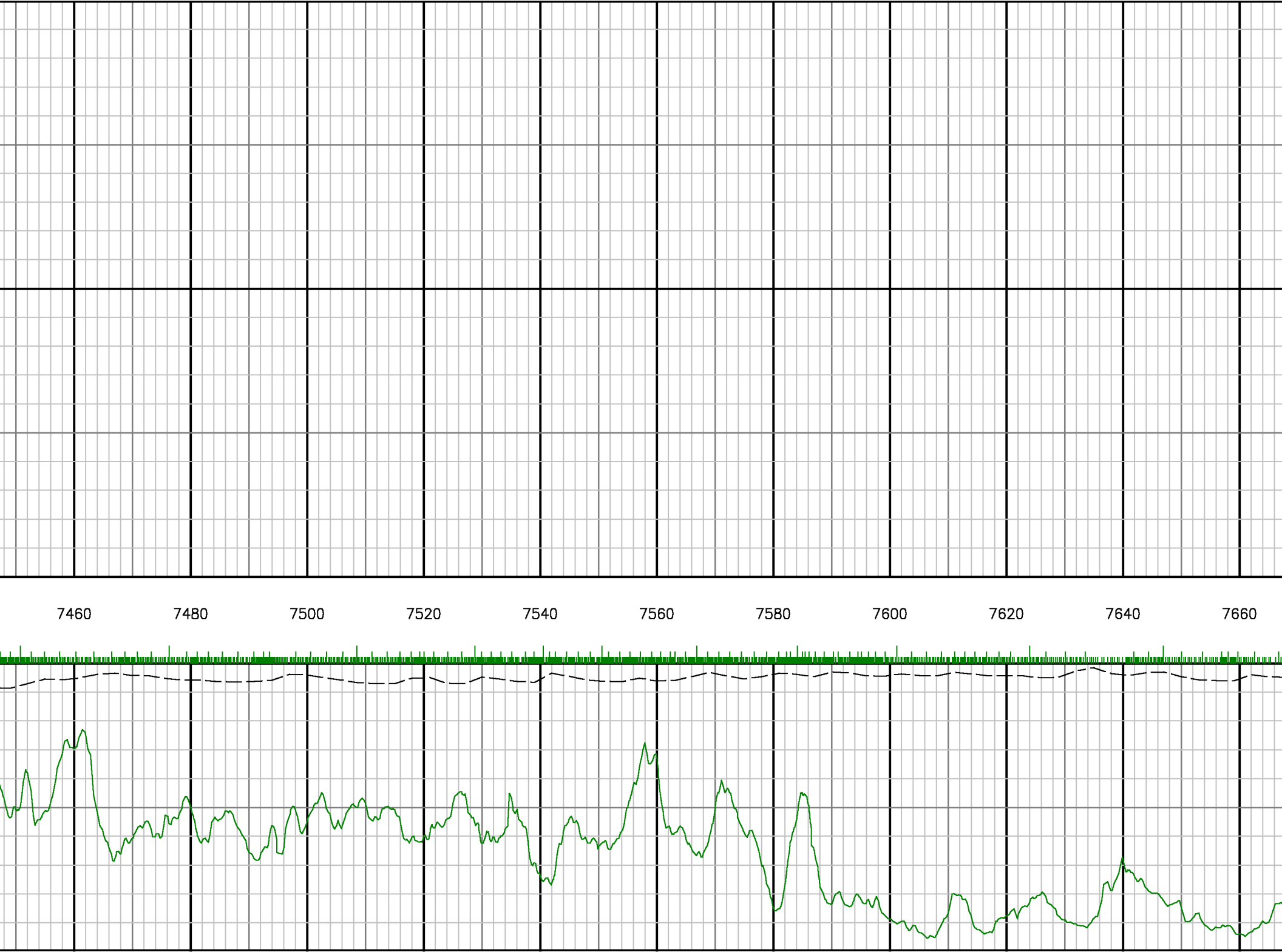
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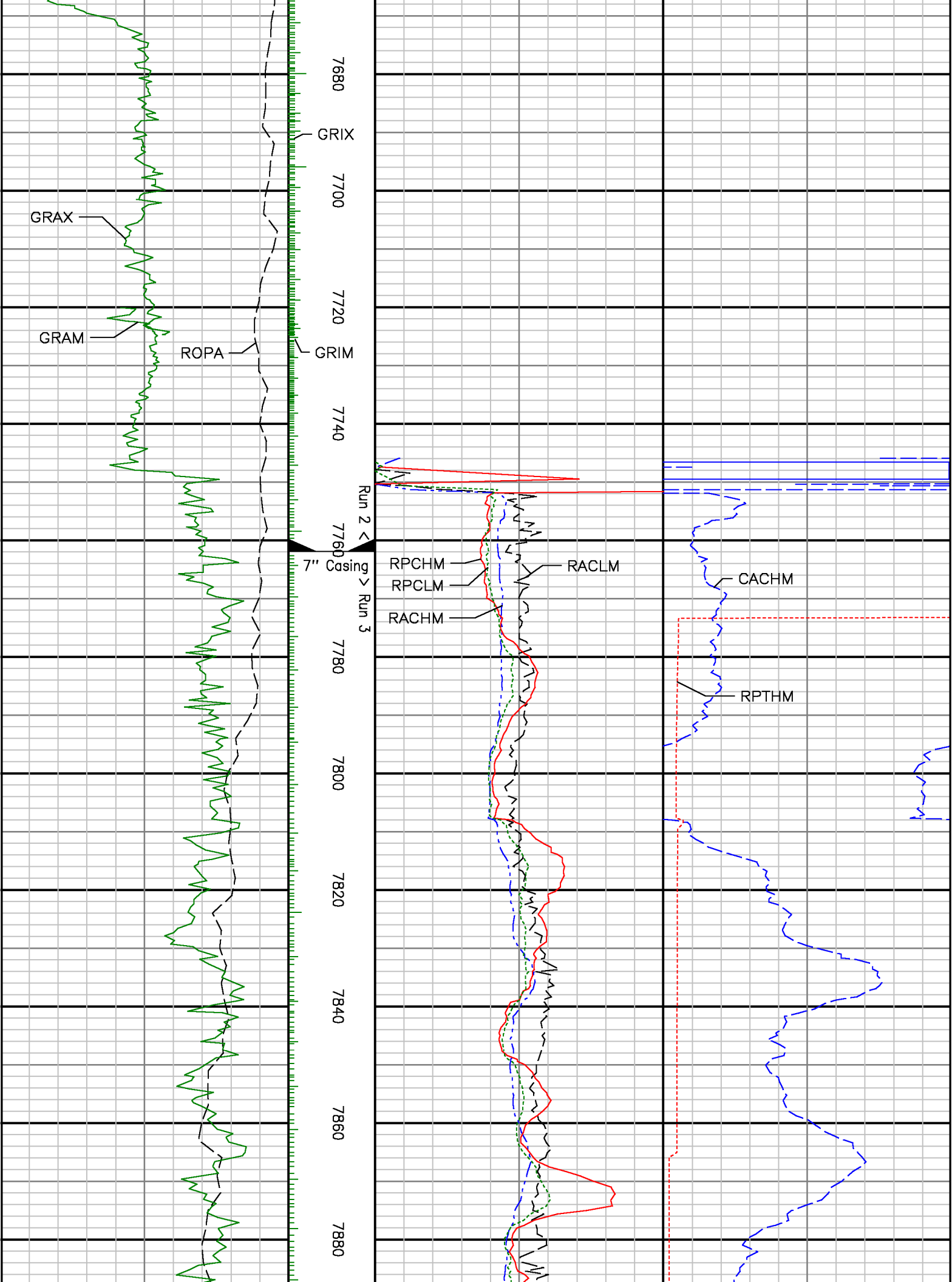
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7720
7740
7760
7780
7800
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7840
7860
7880
GRIX
GRAX
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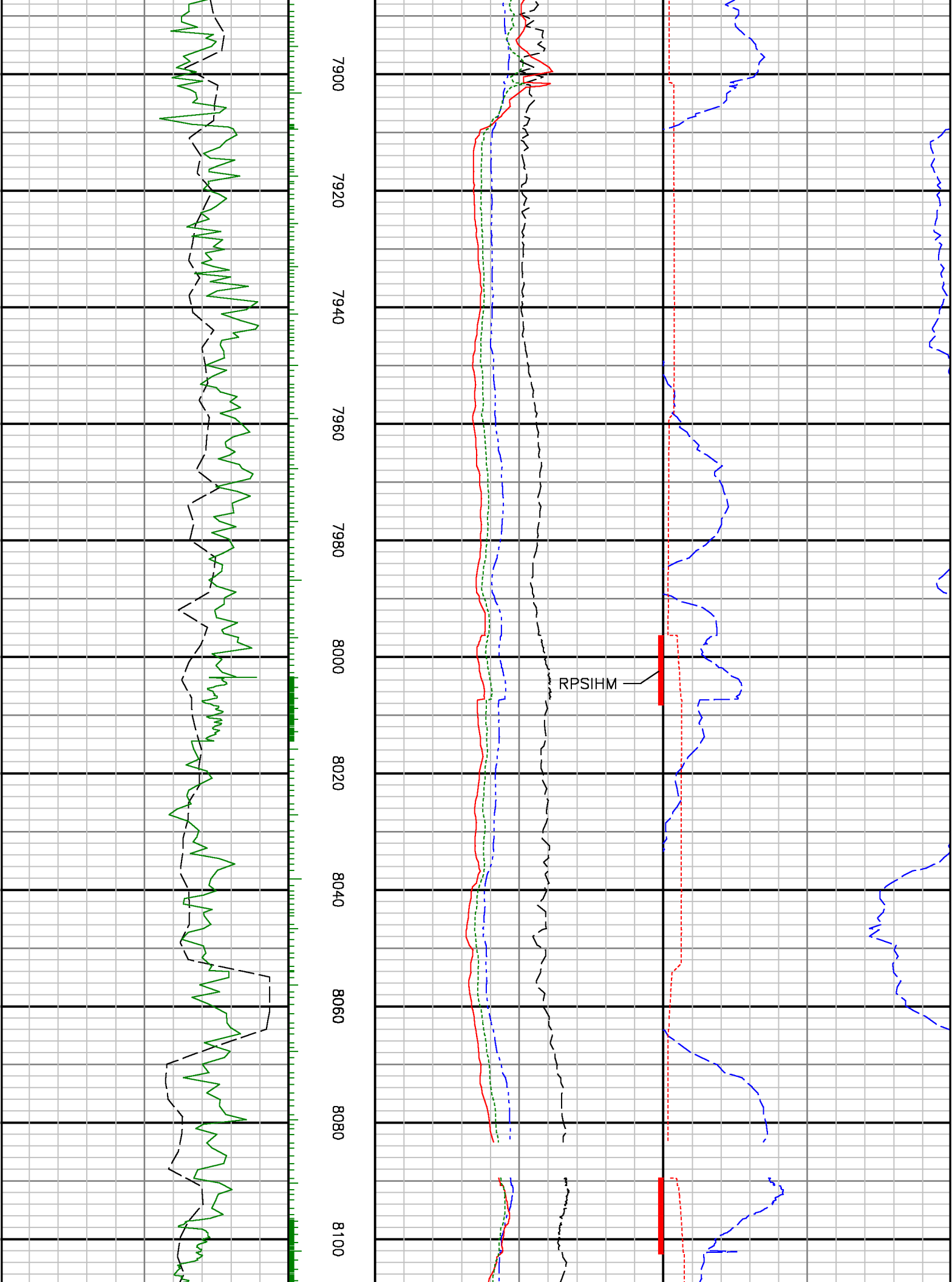
ROPA
GRIM
Run 2 <
7" Casing
> Run 3
RPCHM
RPCLM
RACHM
RACLM
CACHM
RPTHM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8080
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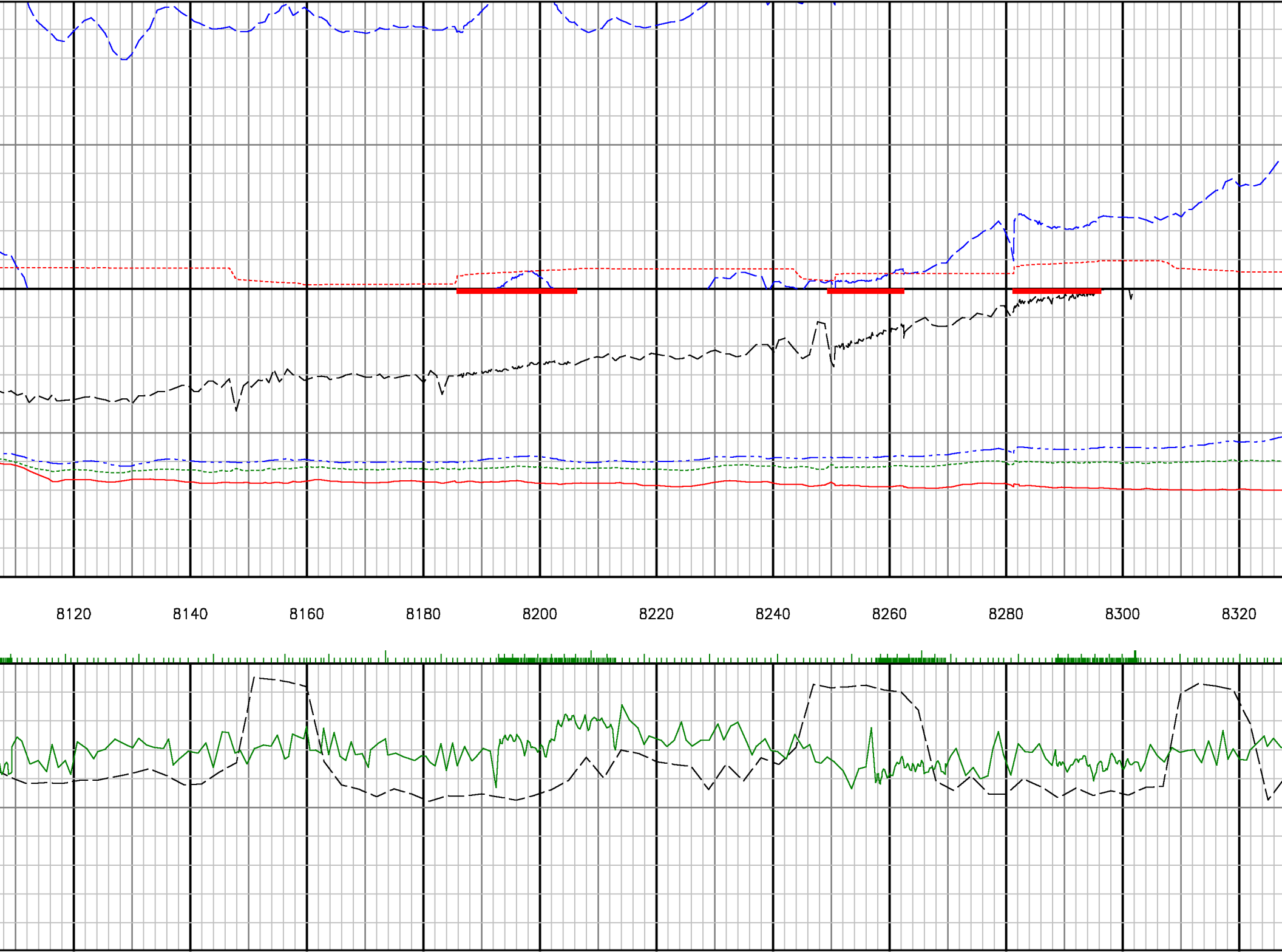
RPSIHM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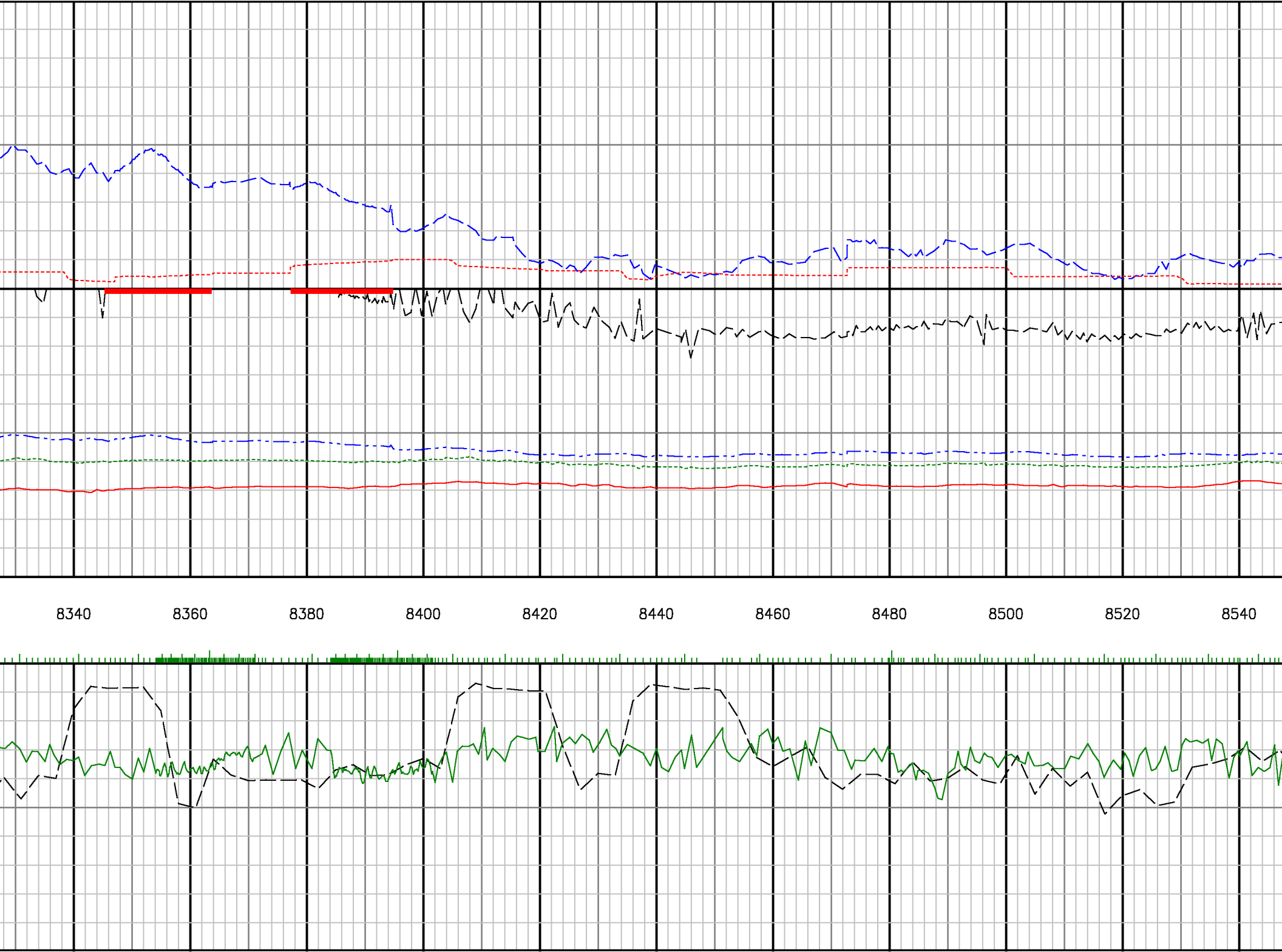
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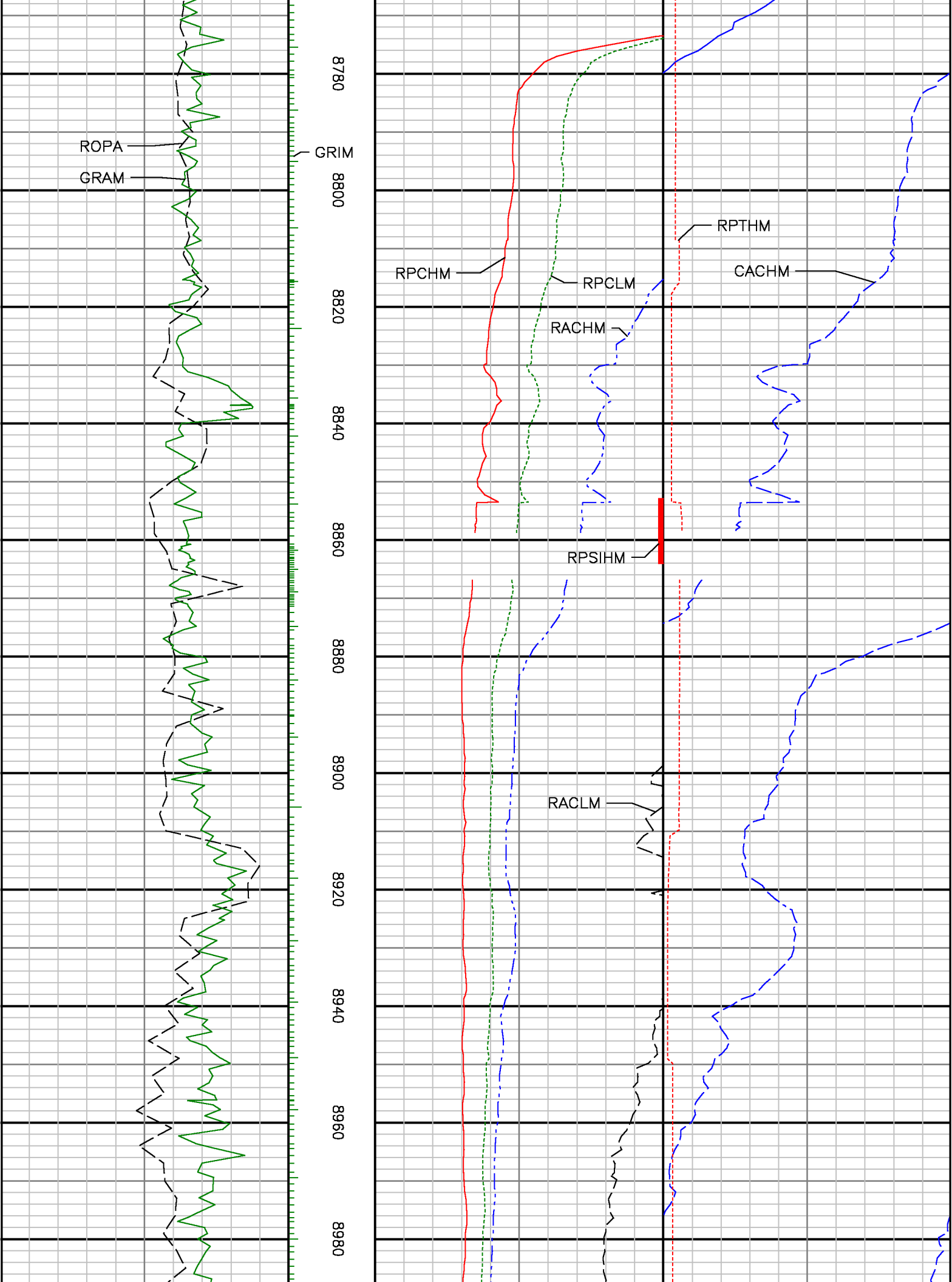
8760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GRIM
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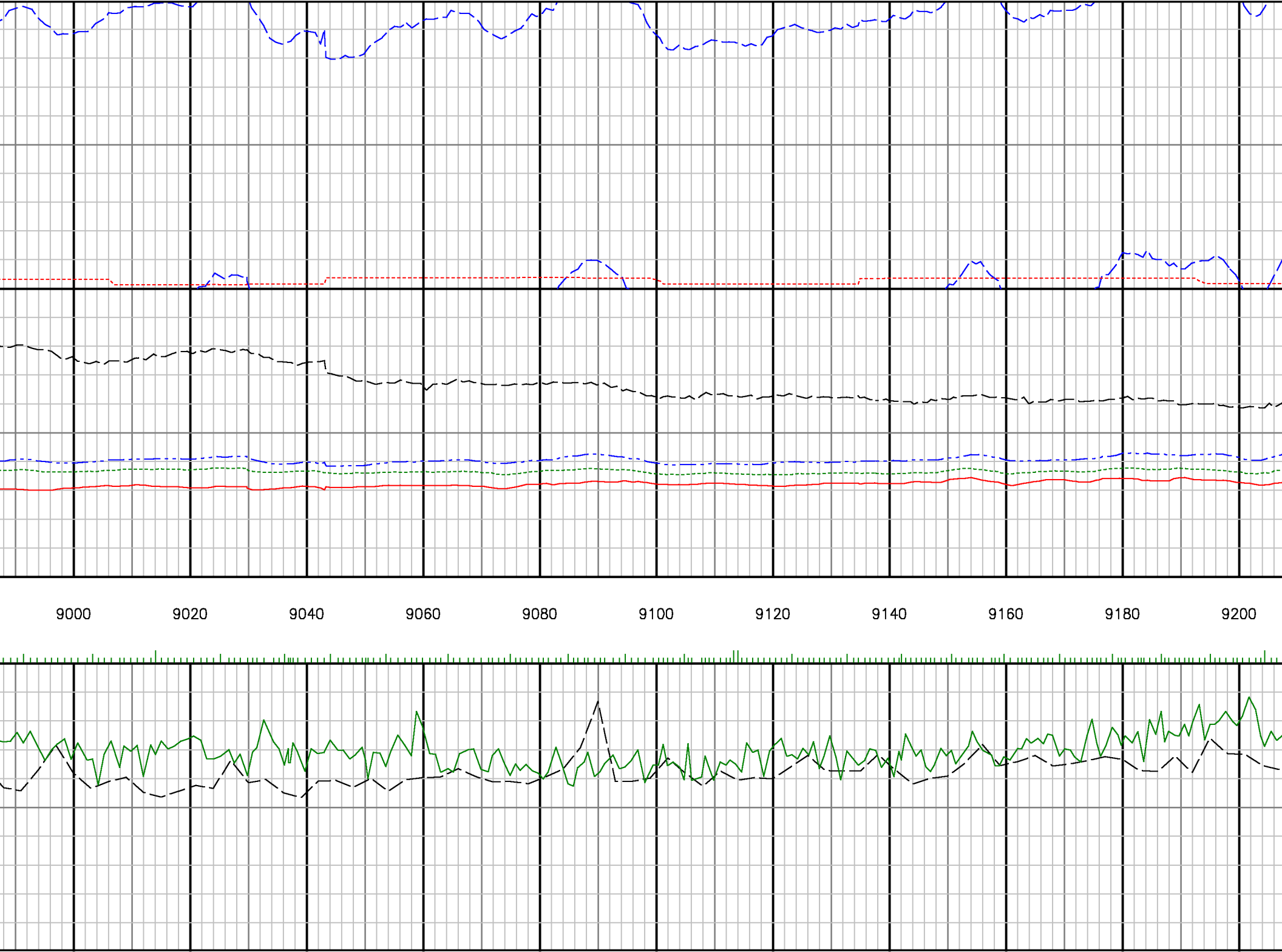
RPTHM
CACHM
RACHM
RPSIHM
RACLM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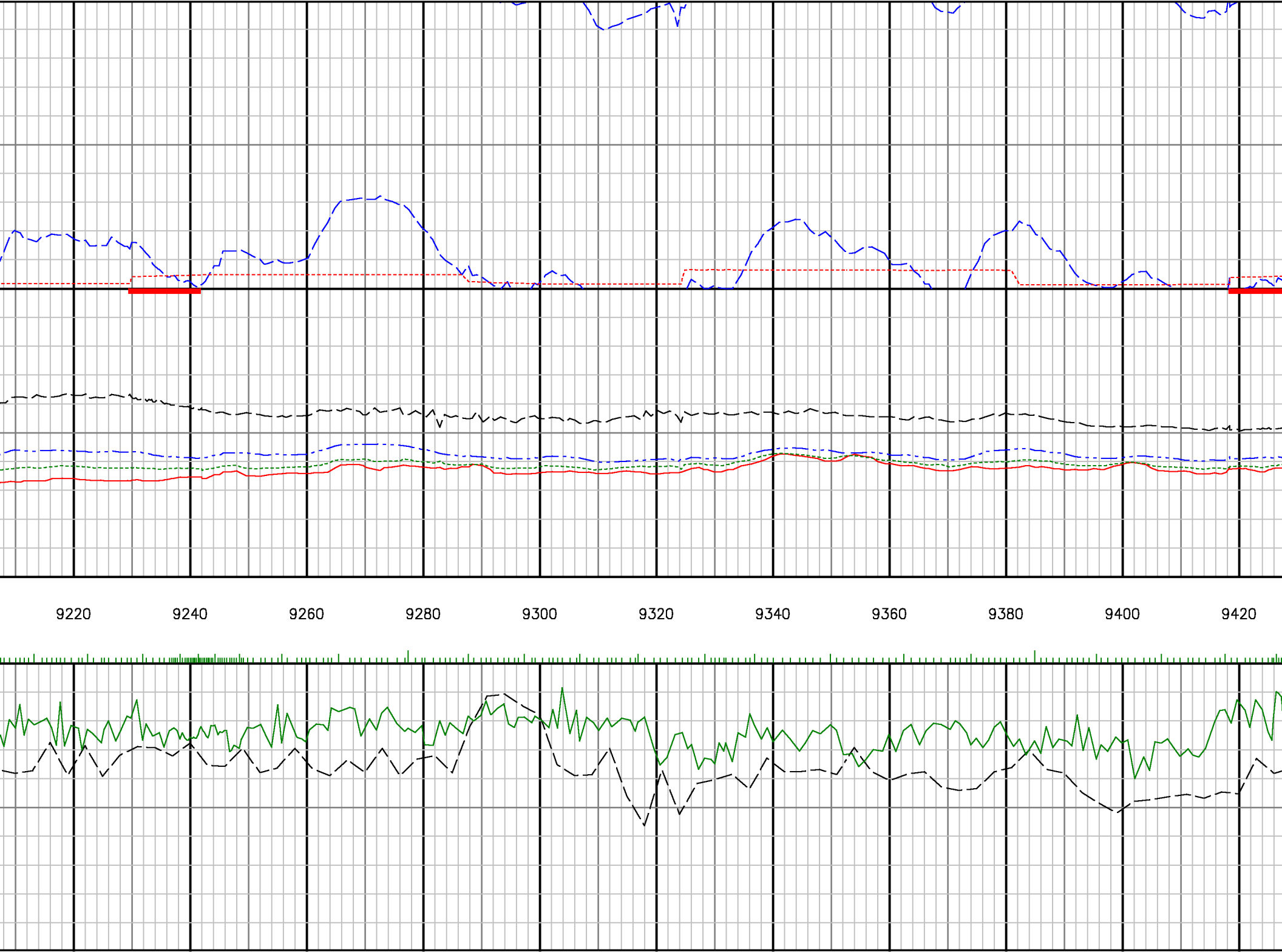
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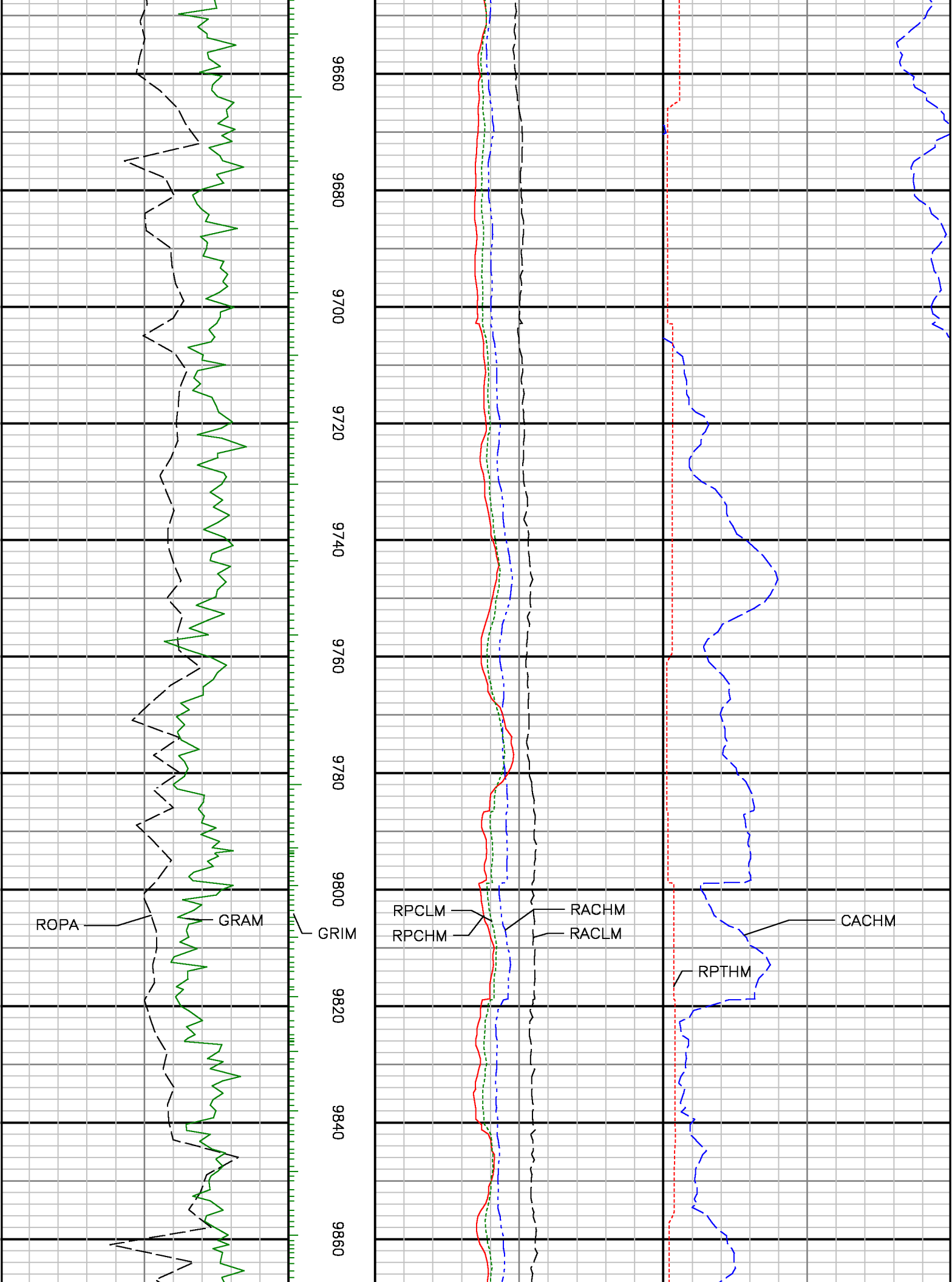
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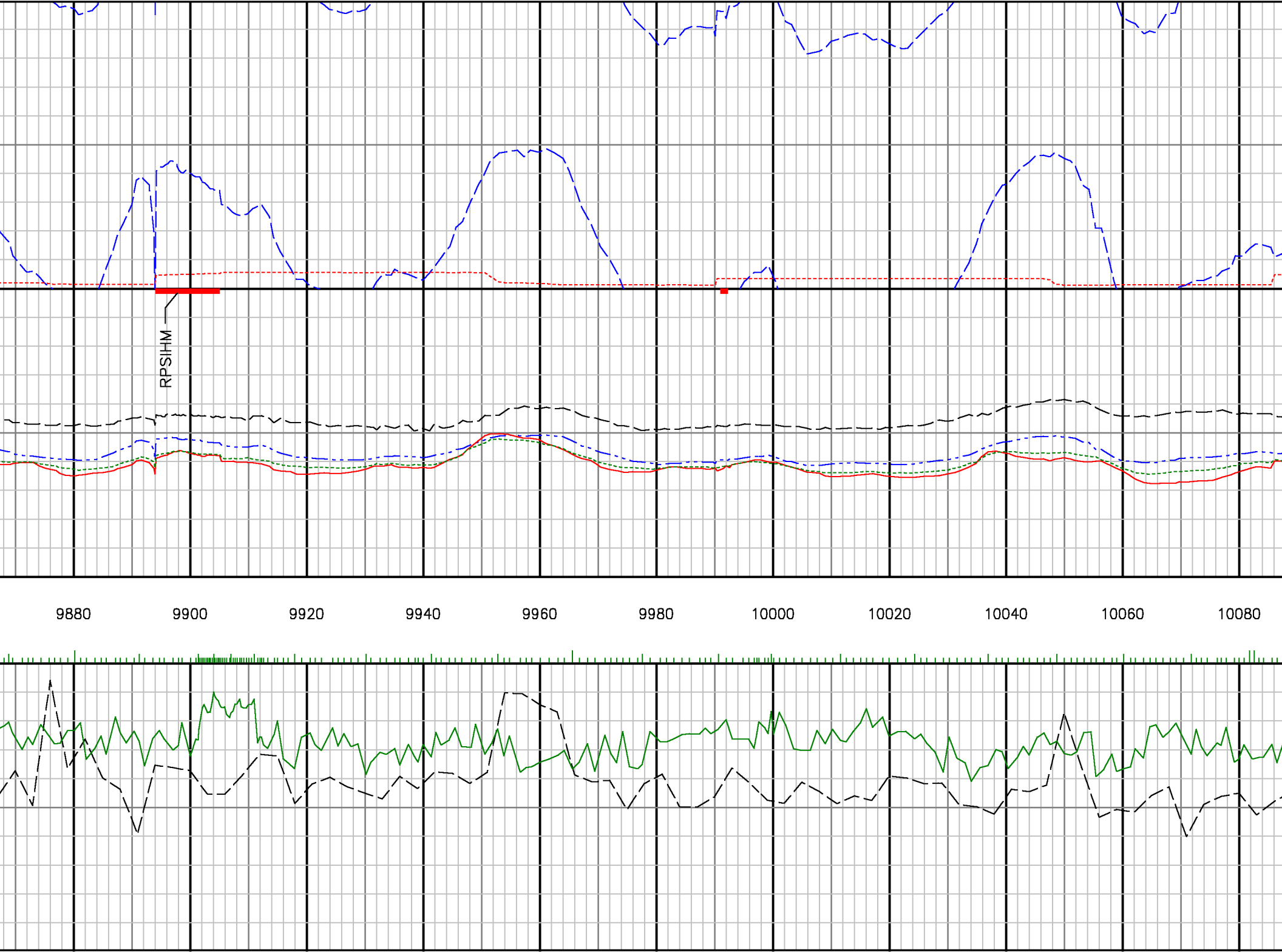
RPCHM
RACHM
RACLM
CACHM
RPTHM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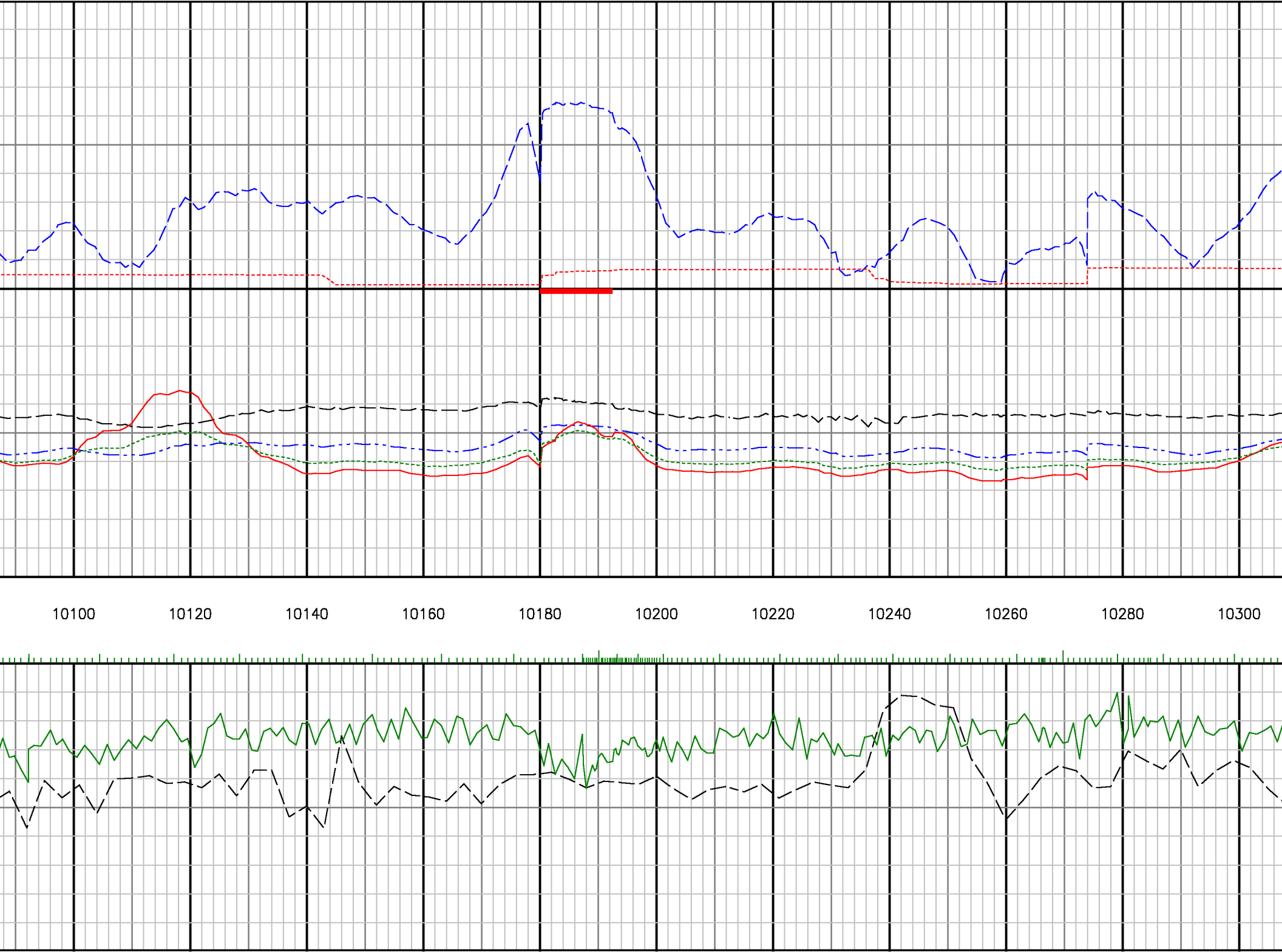
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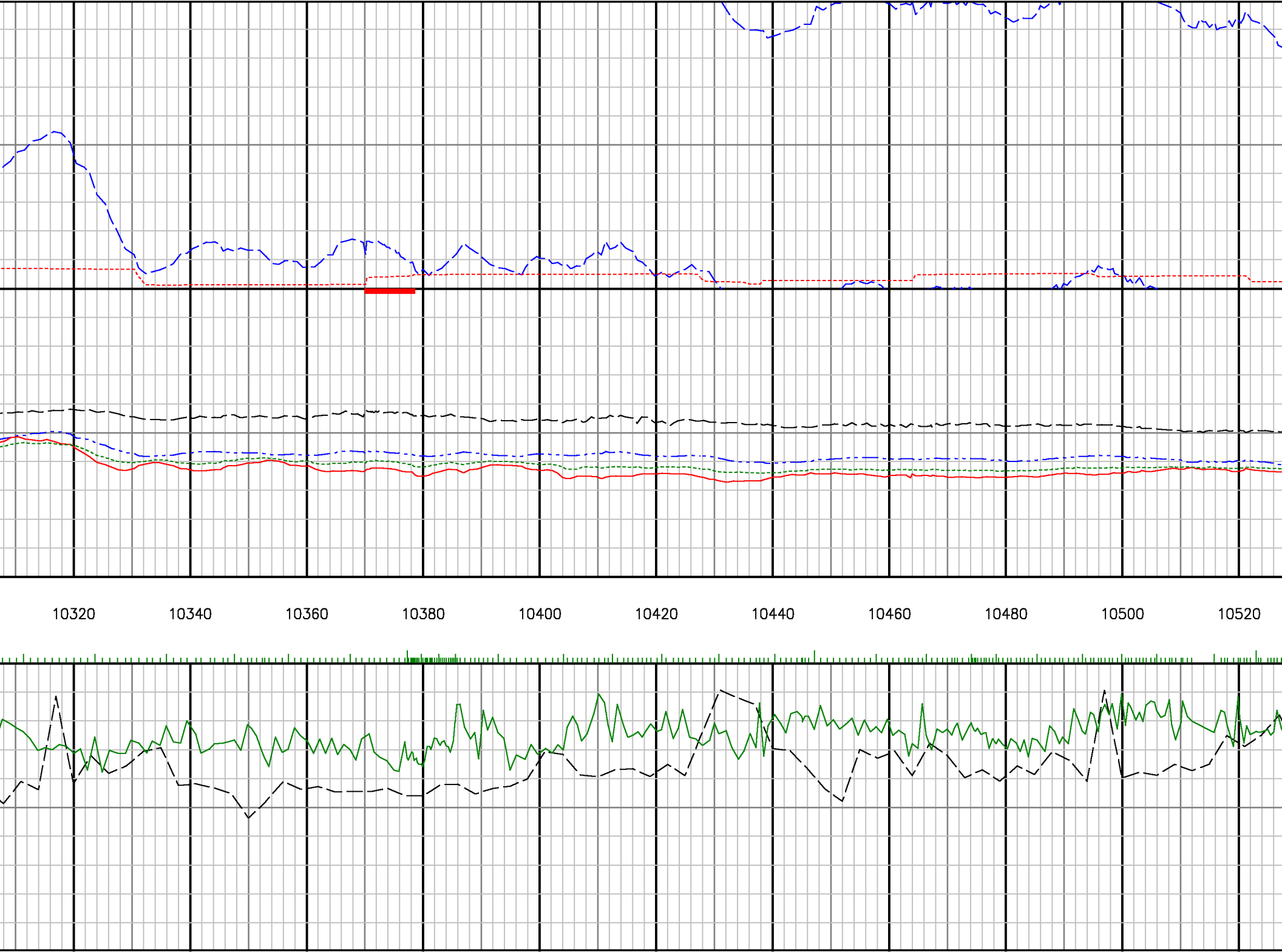
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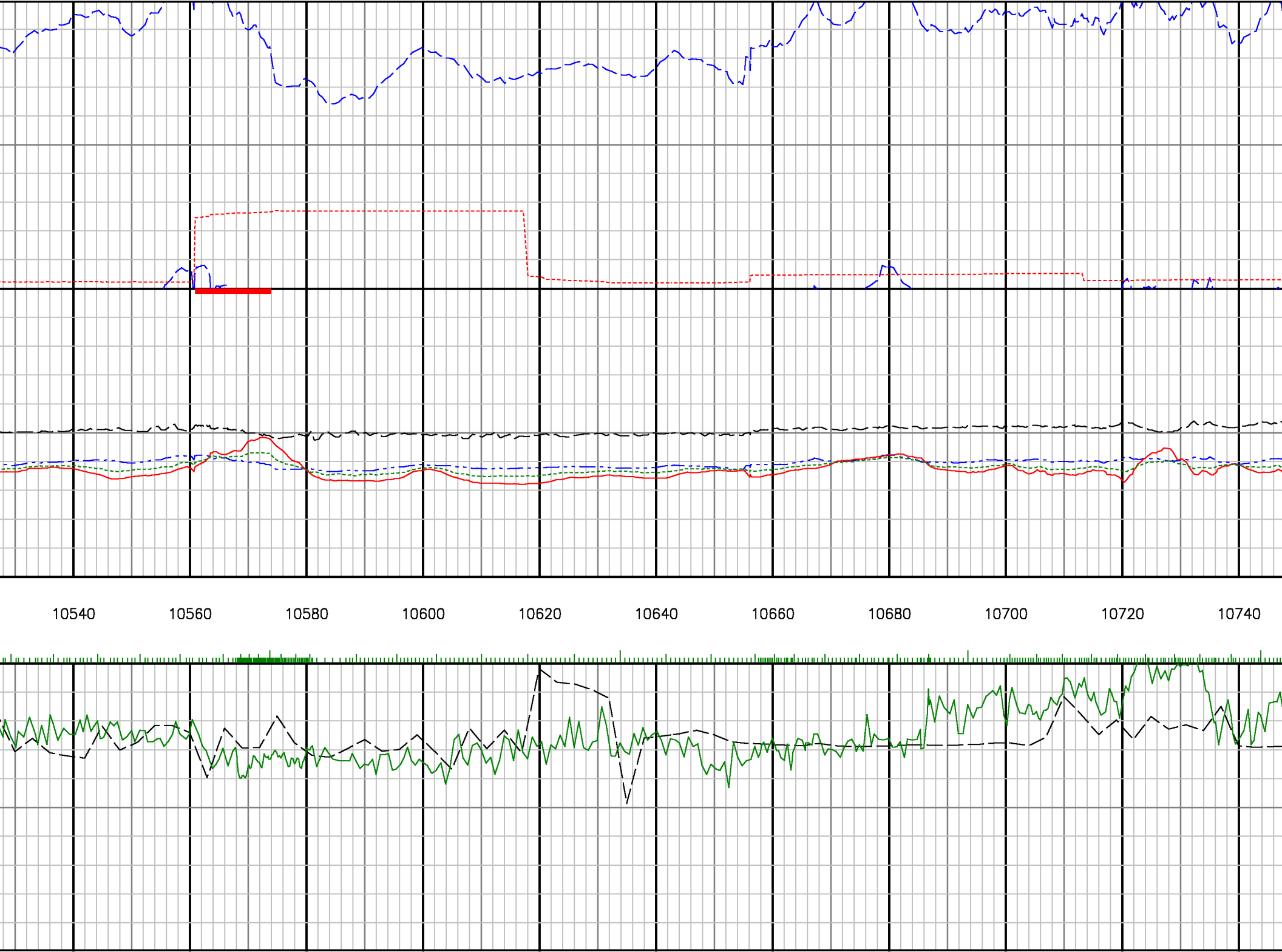
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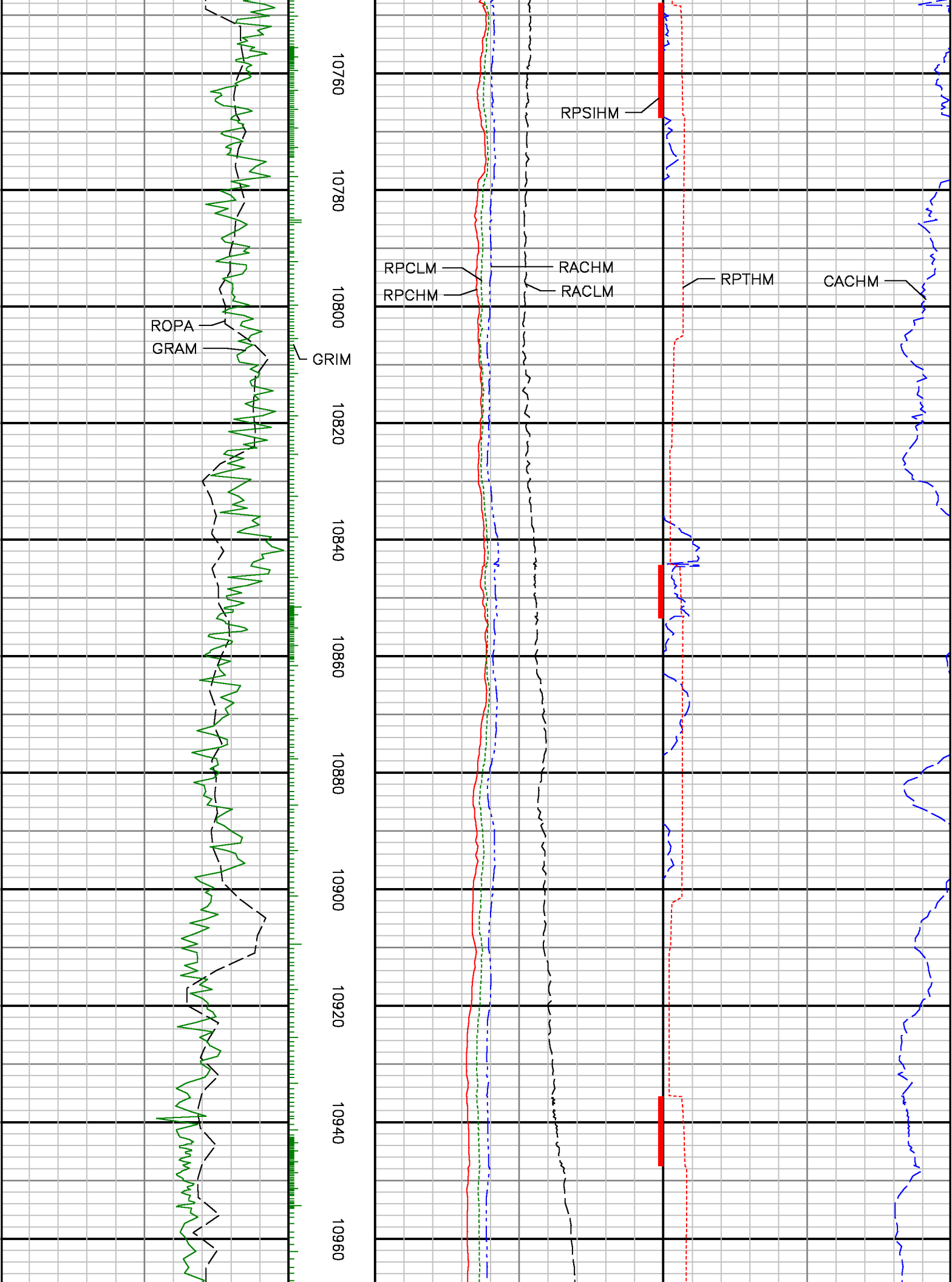
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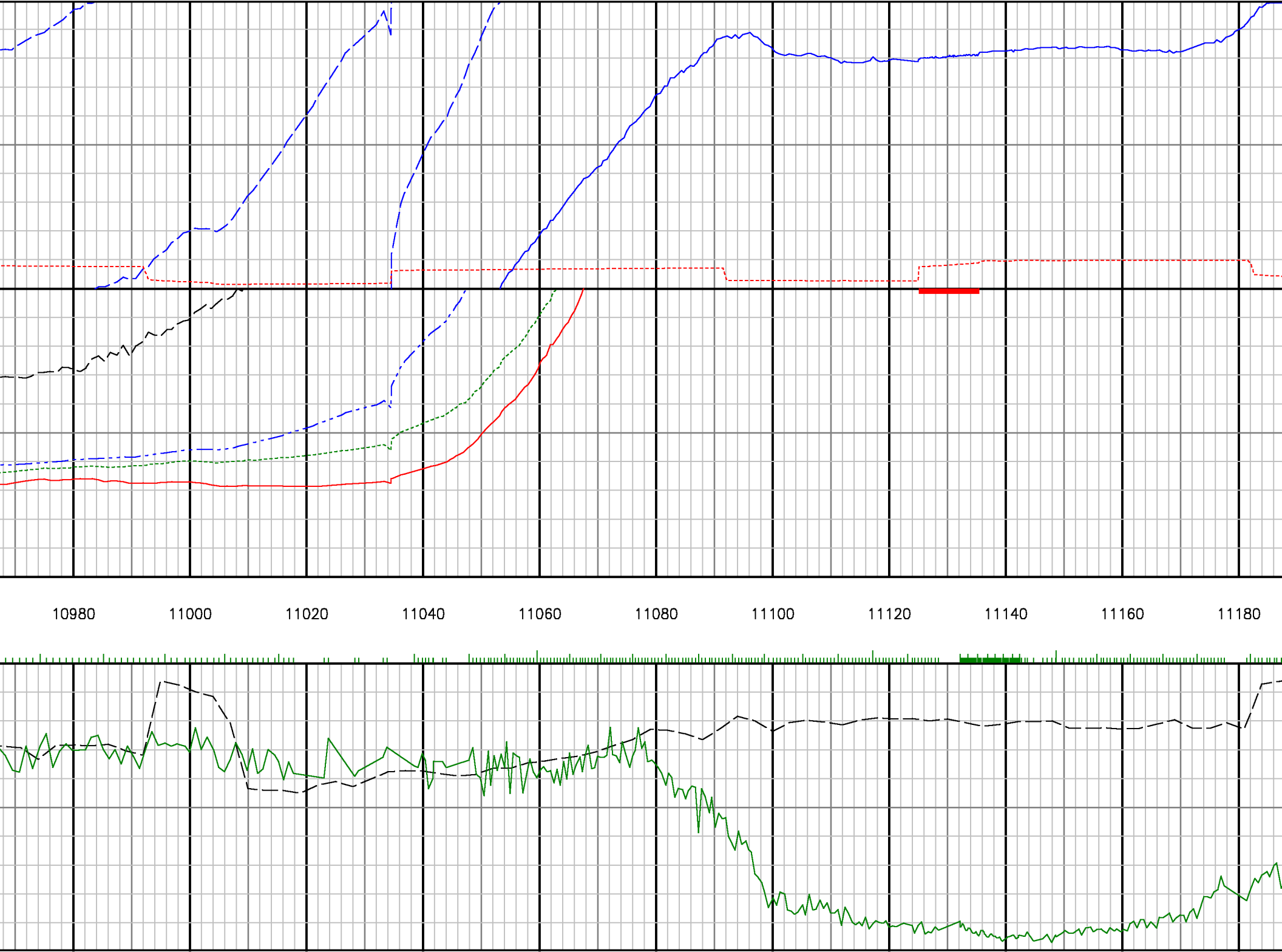
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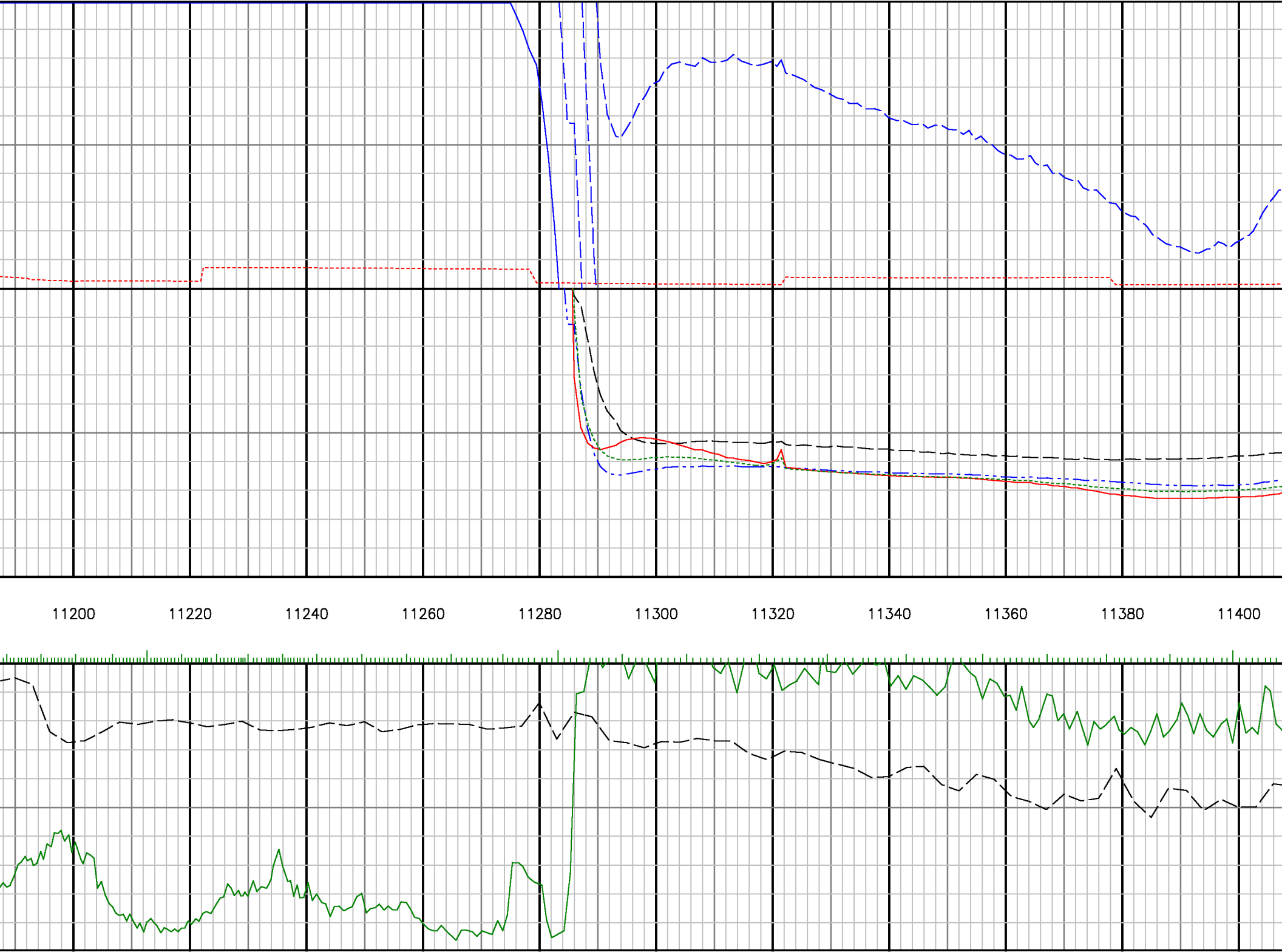
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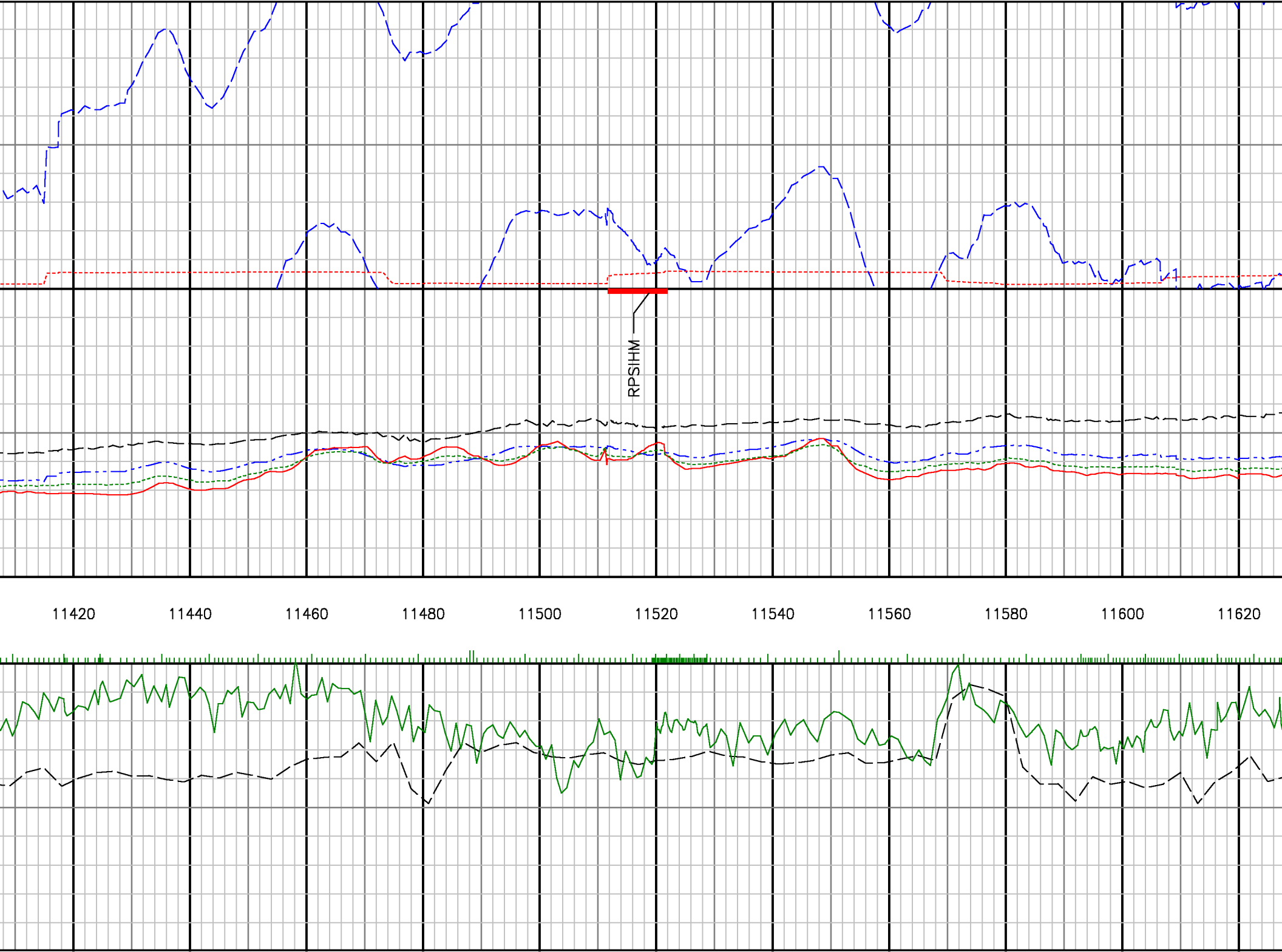
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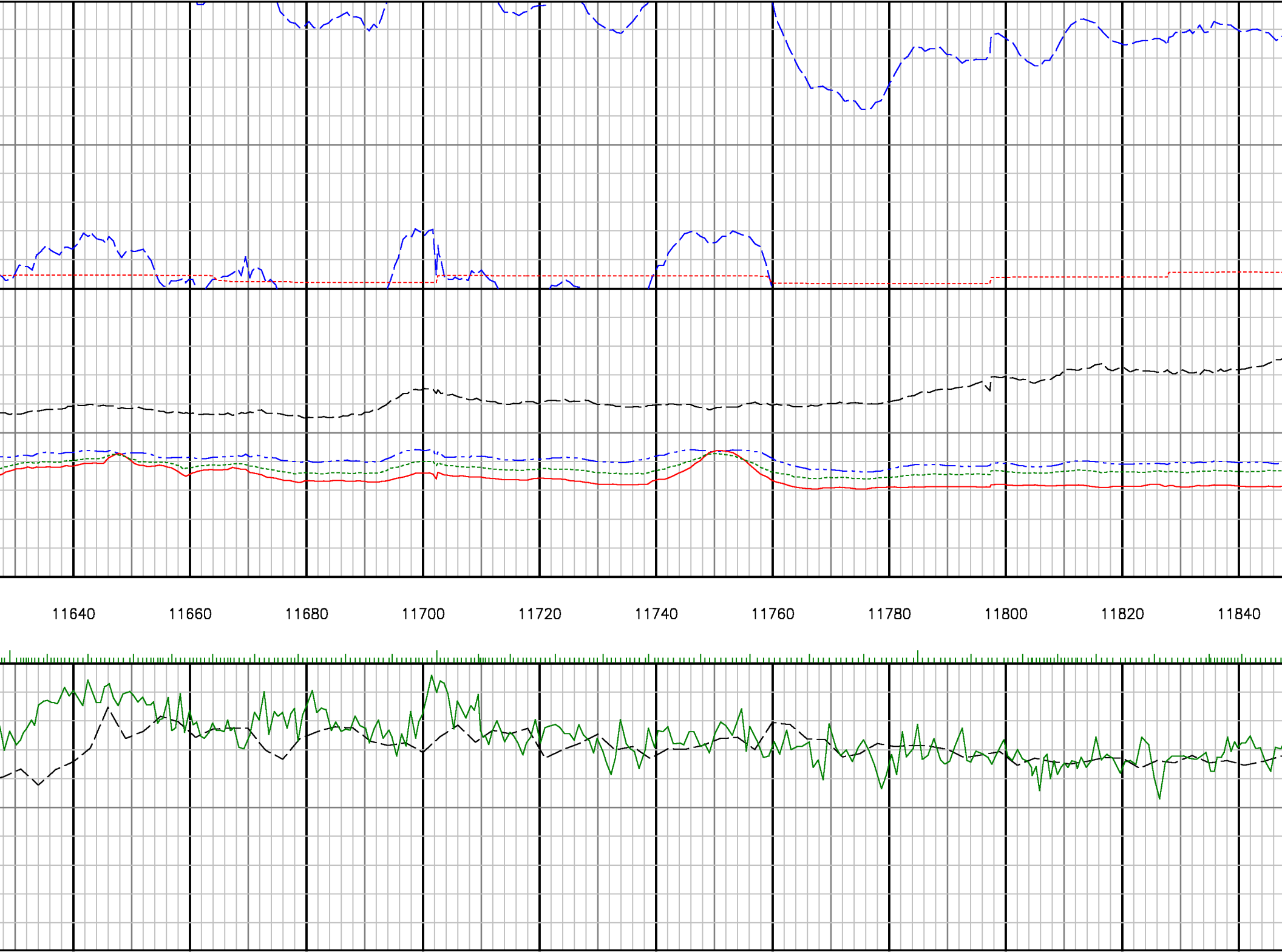
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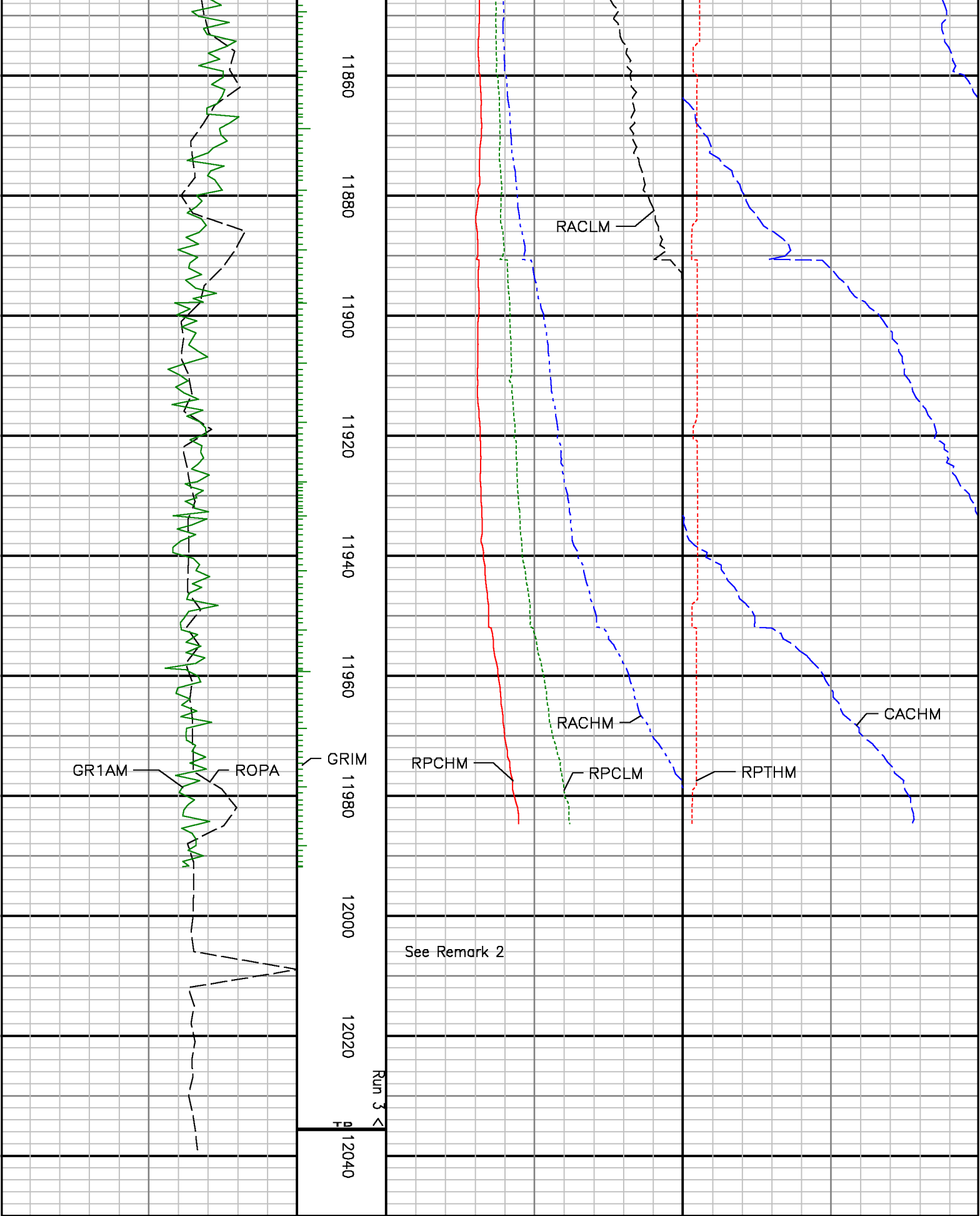
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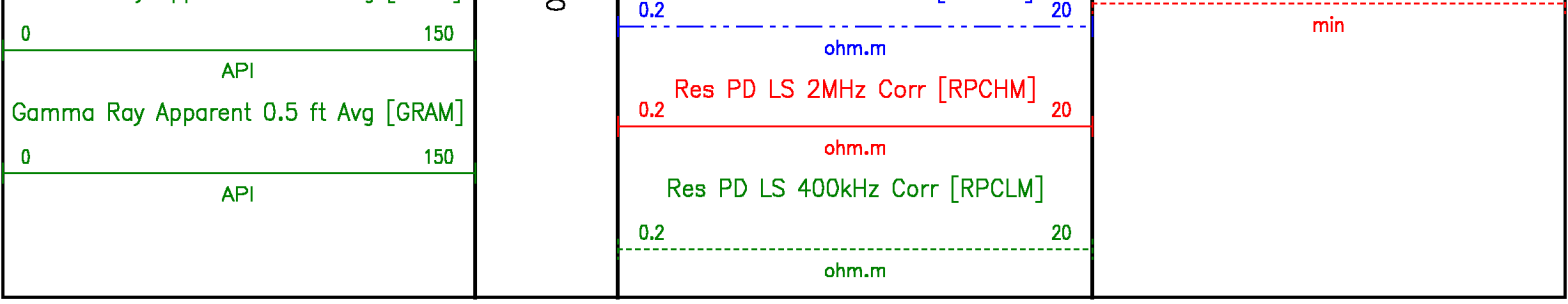
12000
12020
12040
GR1AM
ROPA
GRIM
RACLM
RACHM
RPCHM
RPCLM
RPTHM
CACHM
See Remark 2
Run 3 <
Rate of Penetration 3.0 ft Avg [ROPA]
1000
0
ft/hr
Gamma Ray Apparent 0.5 ft Avg [GRAX]
MD feet 1:24
Res AT LS 400kHz Corr [RACLM]
0.2
20
ohm.m
Res AT LS 2MHz Corr [RACHM]
Con AT LS 2MHz Corr CACHM
40
0
mmho/m
Time Since Drilled [RPTHM]
0
600


0
150
API
Gamma Ray Apparent 0.5 ft Avg [GRAM]
0
150
API
0.2
20
ohm.m
Res PD LS 2MHz Corr [RPCHM]
0.2
20
ohm.m
Res PD LS 400kHz Corr [RPCLM]
0.2
20
ohm.m
min