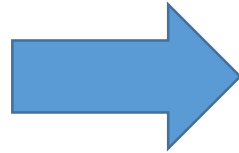


Xboxes Update

02/09/2020

Summary

- XBOX1: LLRF & Software Testing
- XBOX2:
 - 33.6MW and stable.
 - Measurable dark current signal.
- XBOX3AB: T42 Structures
 - Has been offline due to a modulator problem.



- XBOX1: LLRF & Software Testing
- XBOX2:
 - Didn't run during weekend (chiller alarm).
 - Now at 35.5 peak input power and stable.
 - If we run without interruptions we might reach 100MV/m this month.
 - Difficulty with transmitted power measurement.
- XBOX3AB: T42 Structures
 - Restarted last Wednesday after being OFF for 10 days
 - Bad restart – Line 1 dropped back to 12MW (previously at 22MW)
 - Line 2 is fine, low BDR and flat running at 23MW
 - This morning I found the K6 chiller has stopped running

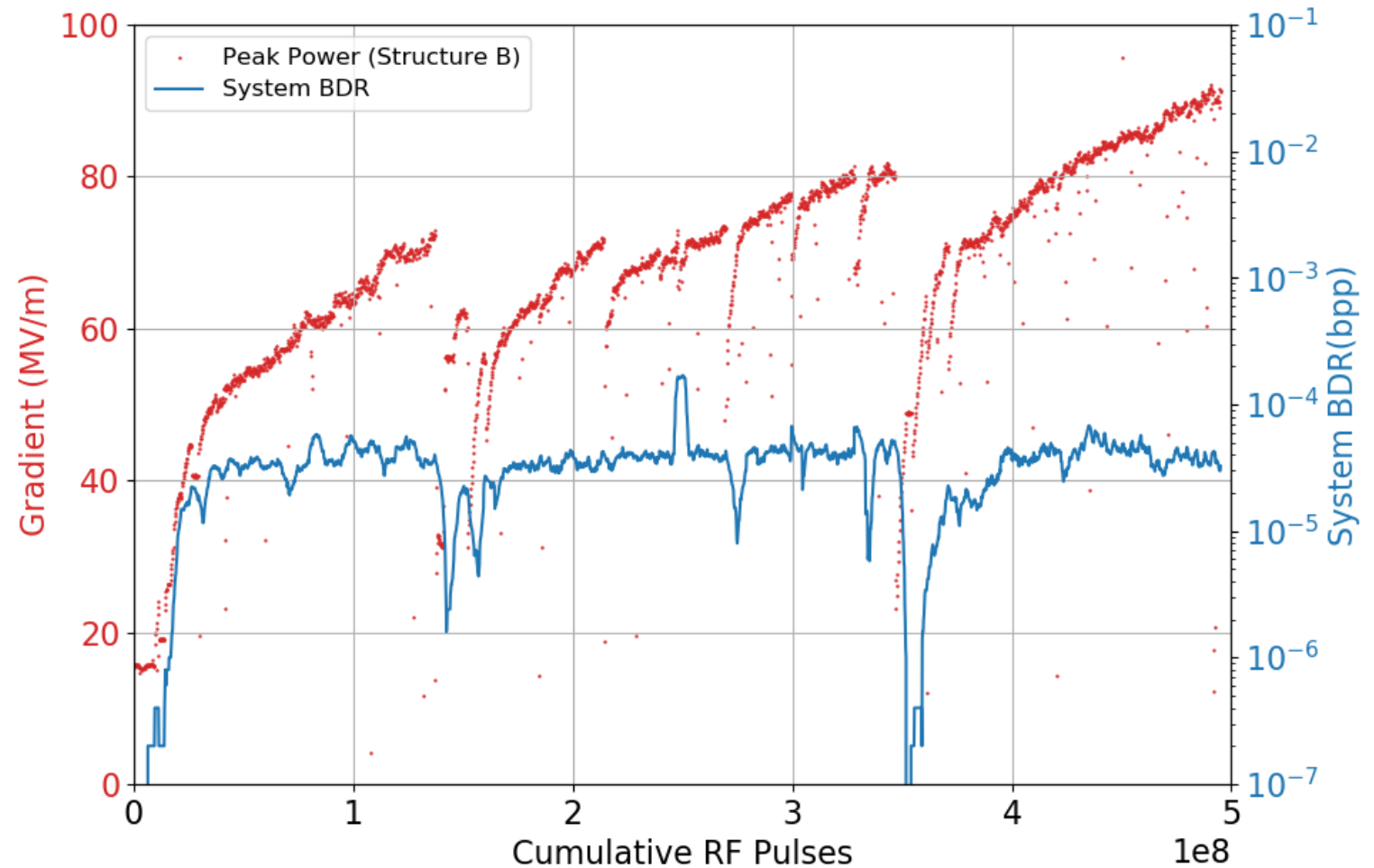
XBOX2

Chiller alarm on Friday evening, didn't run during the weekend. Also had a software crash on Monday evening, so not much runtime.

Now at **35/31 MW** (highest we have ever been!).

Parameters:

- 0.7us klystron pulse
- 50ns pulse
- 50Hz rep rate
- **Target Power:** 40MW Peak in structure B
- **BDR Setpoint:** 3E-5



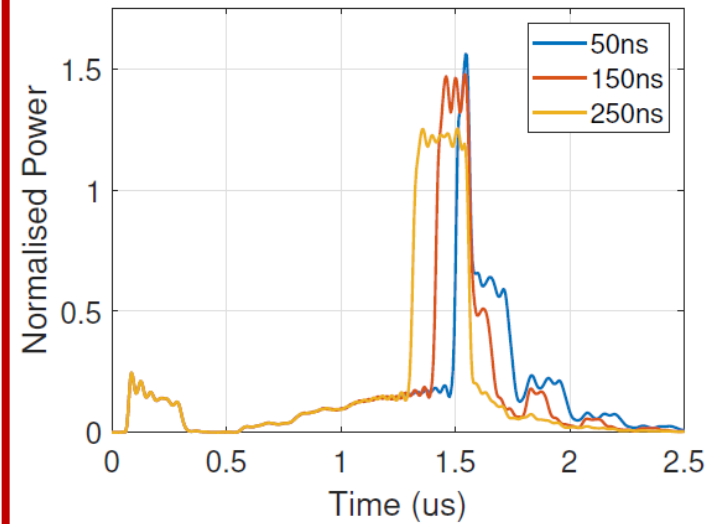
XBOX2 – Pulse Shape study.

Occasionally it is mentioned that the structures receive different pulse shapes.

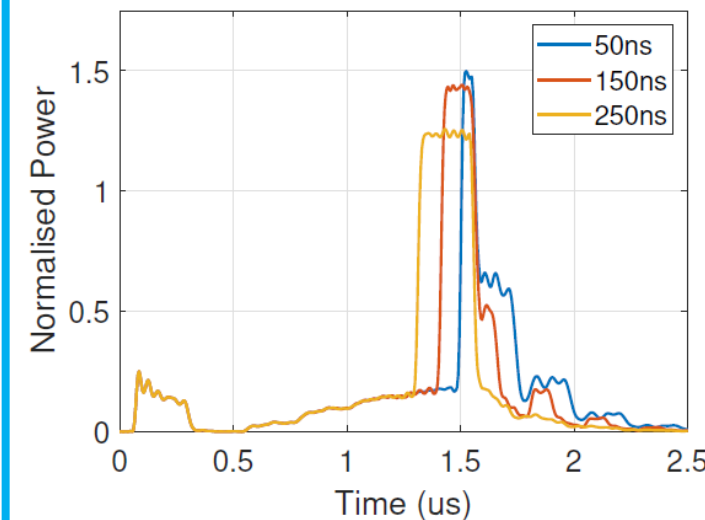
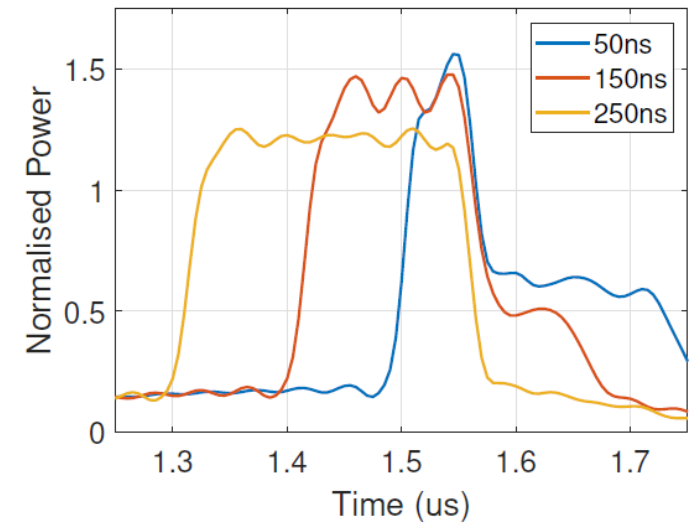
Following last week I ran a quick study for different pulse lengths.

Shown are the pulses seen at **Port 2** and **Port 3**.

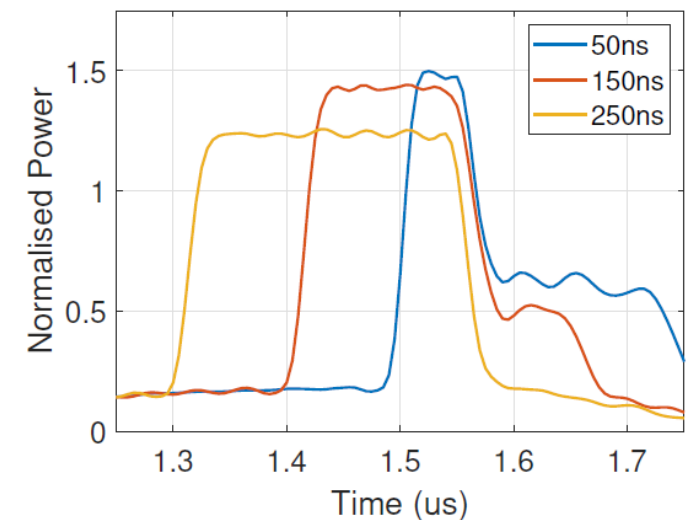
As expected the dispersive effect more prominent at shorter pulse lengths.



Port 2

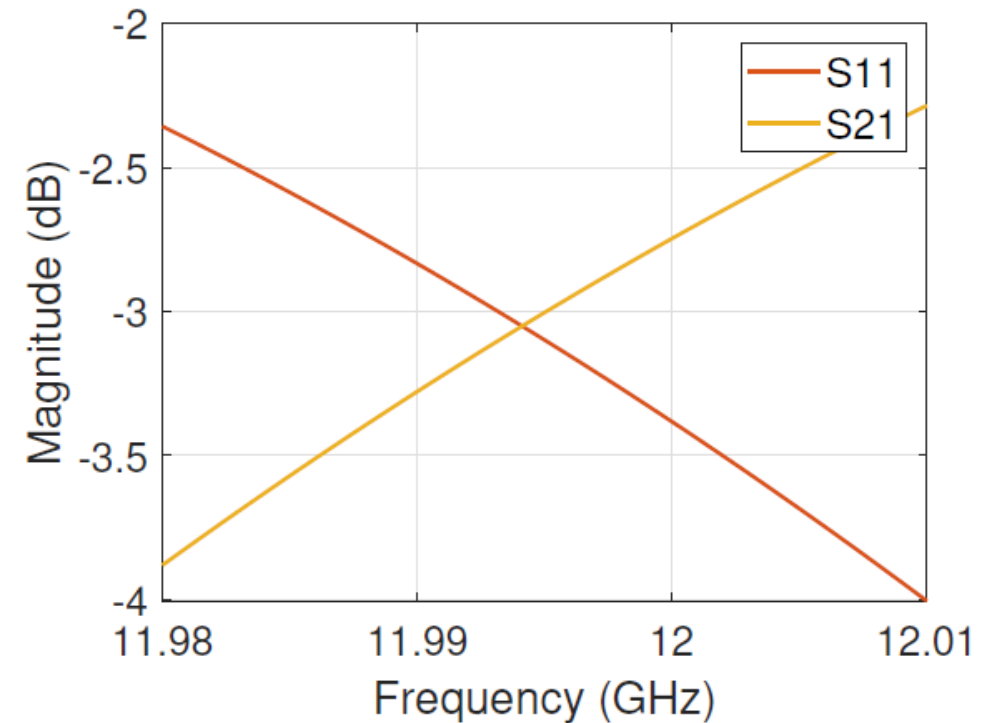
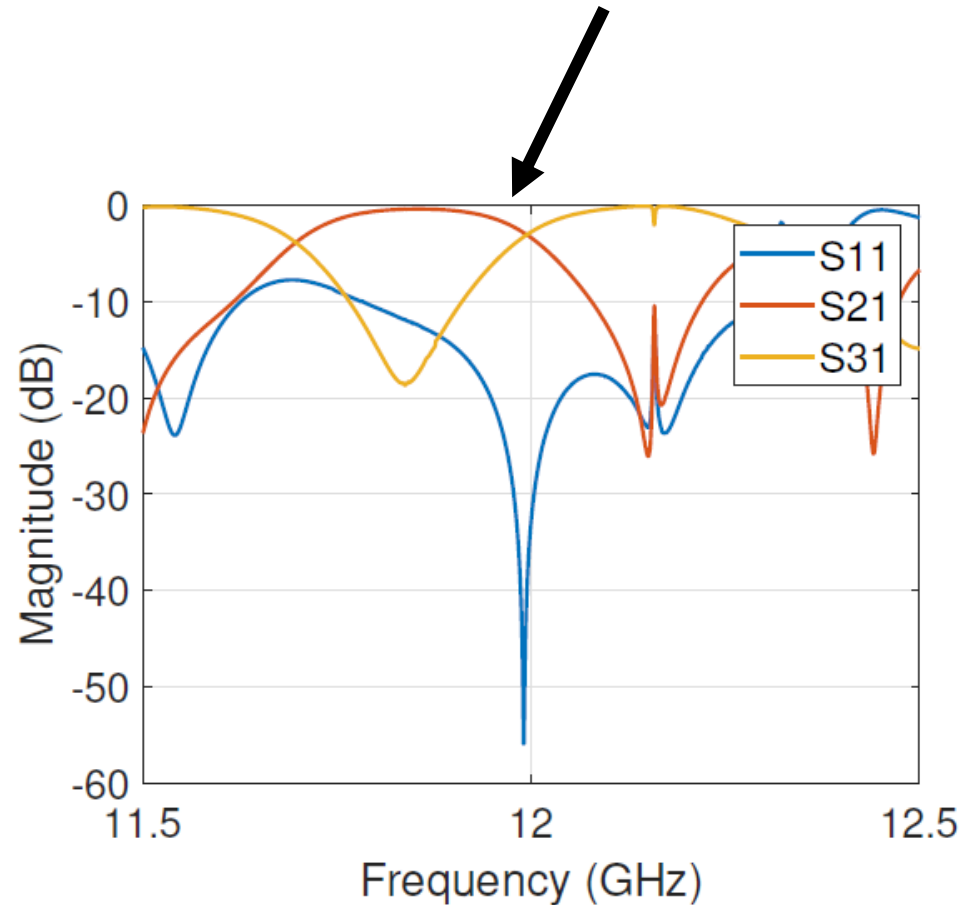


Port 3



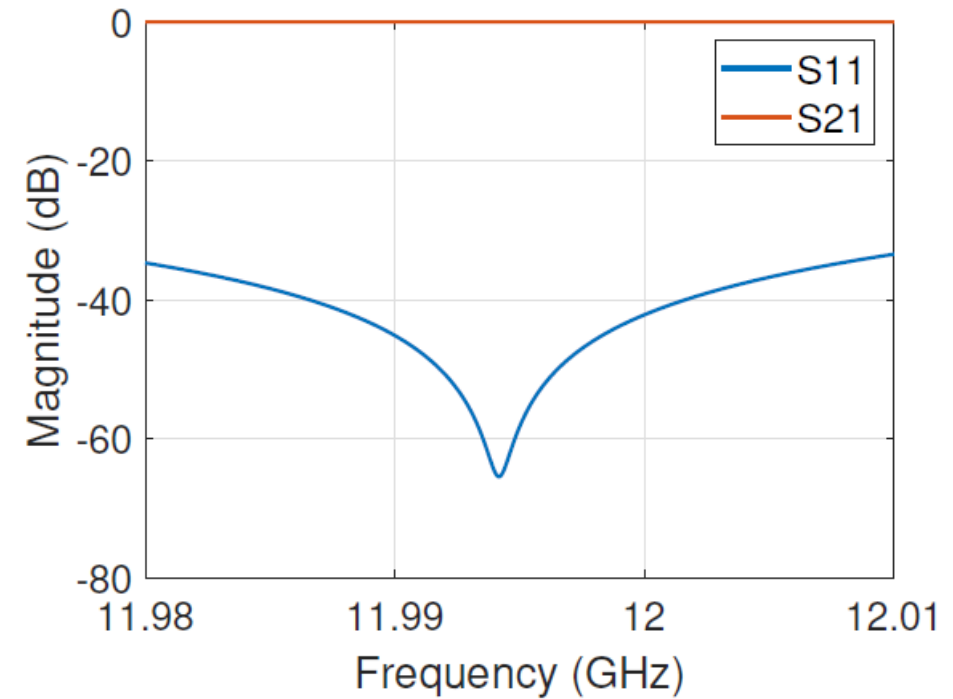
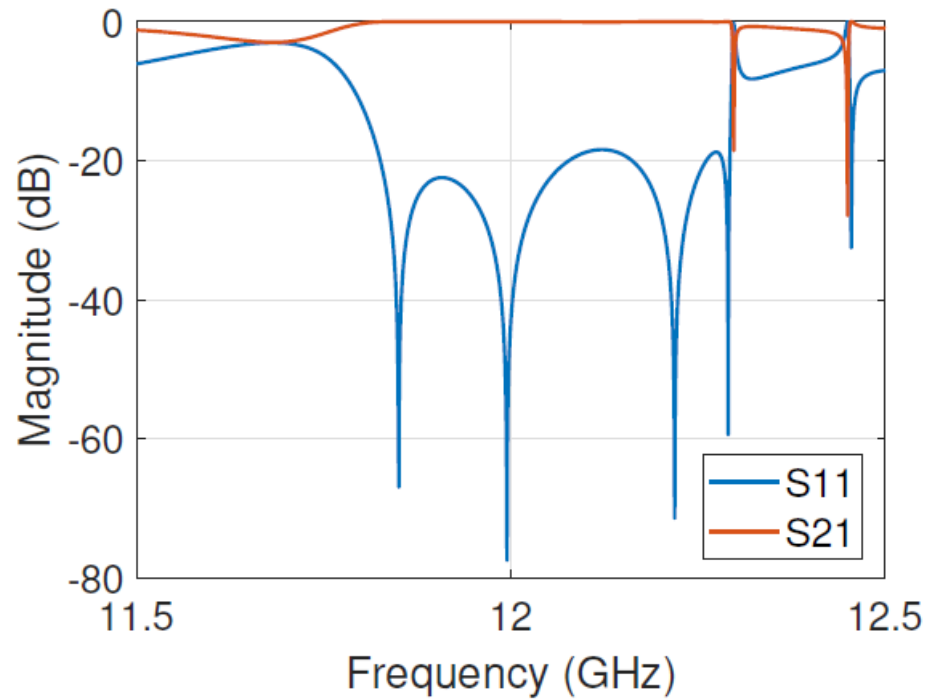
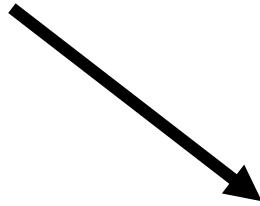
XBOX2 – Pulse Shape study.

Cause: Appears to be due to the difference between the S21 and S31 values of the power splitter. One filters high frequency components, the other filters lower frequency components.



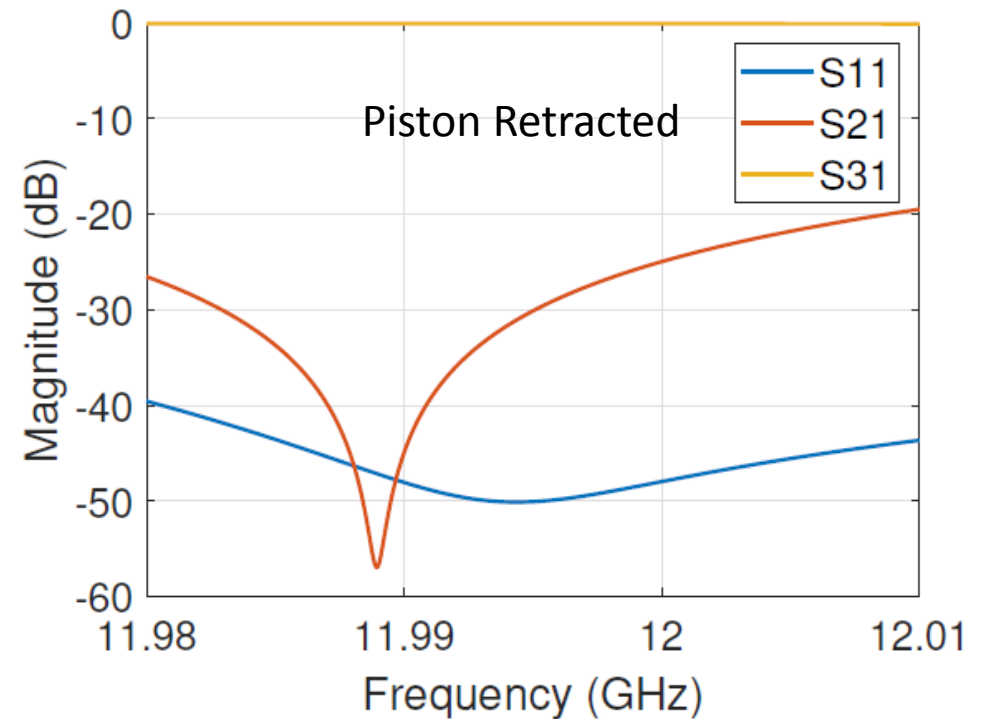
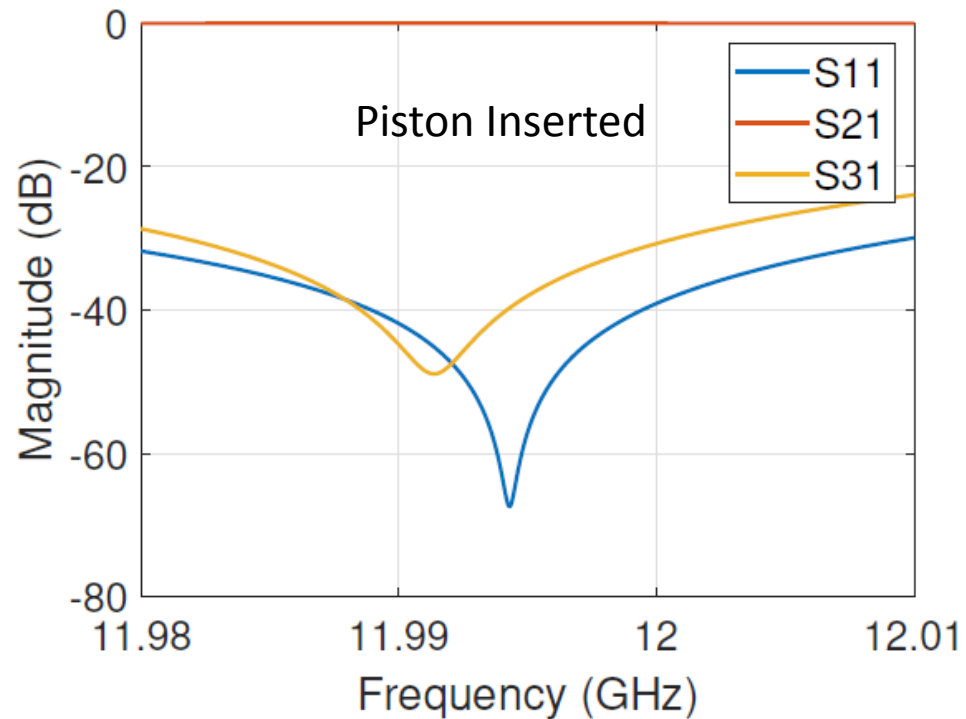
XBOX2 – Phase Shifter.

Phase Shifter has a negligible effect.



XBOX2 – Pulse Shape study.

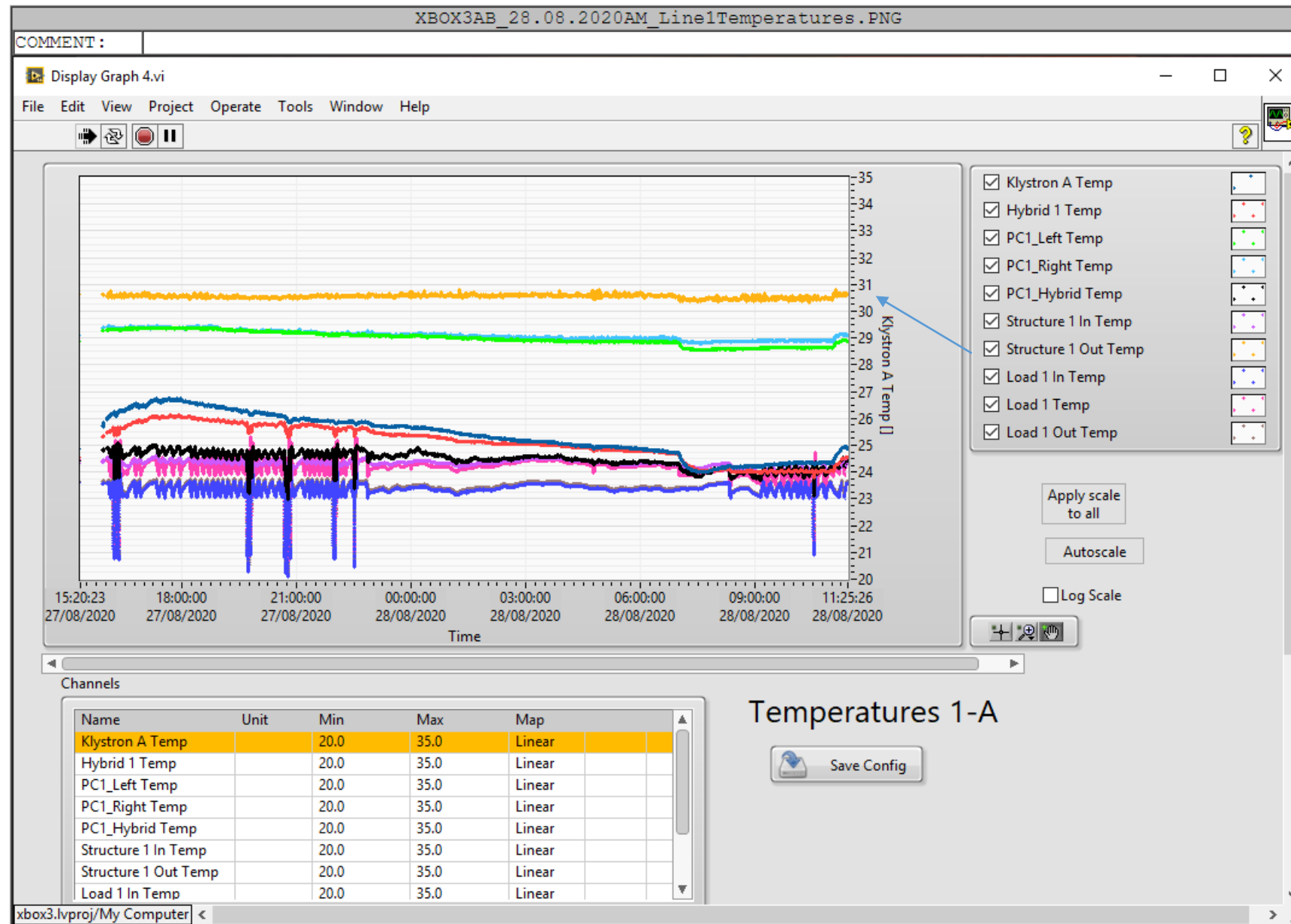
If we deliver all power to port 2 or all power to port 3, the pulses are the same.



XBOX3 AB –Line 1 Structure Temp

Parameters:

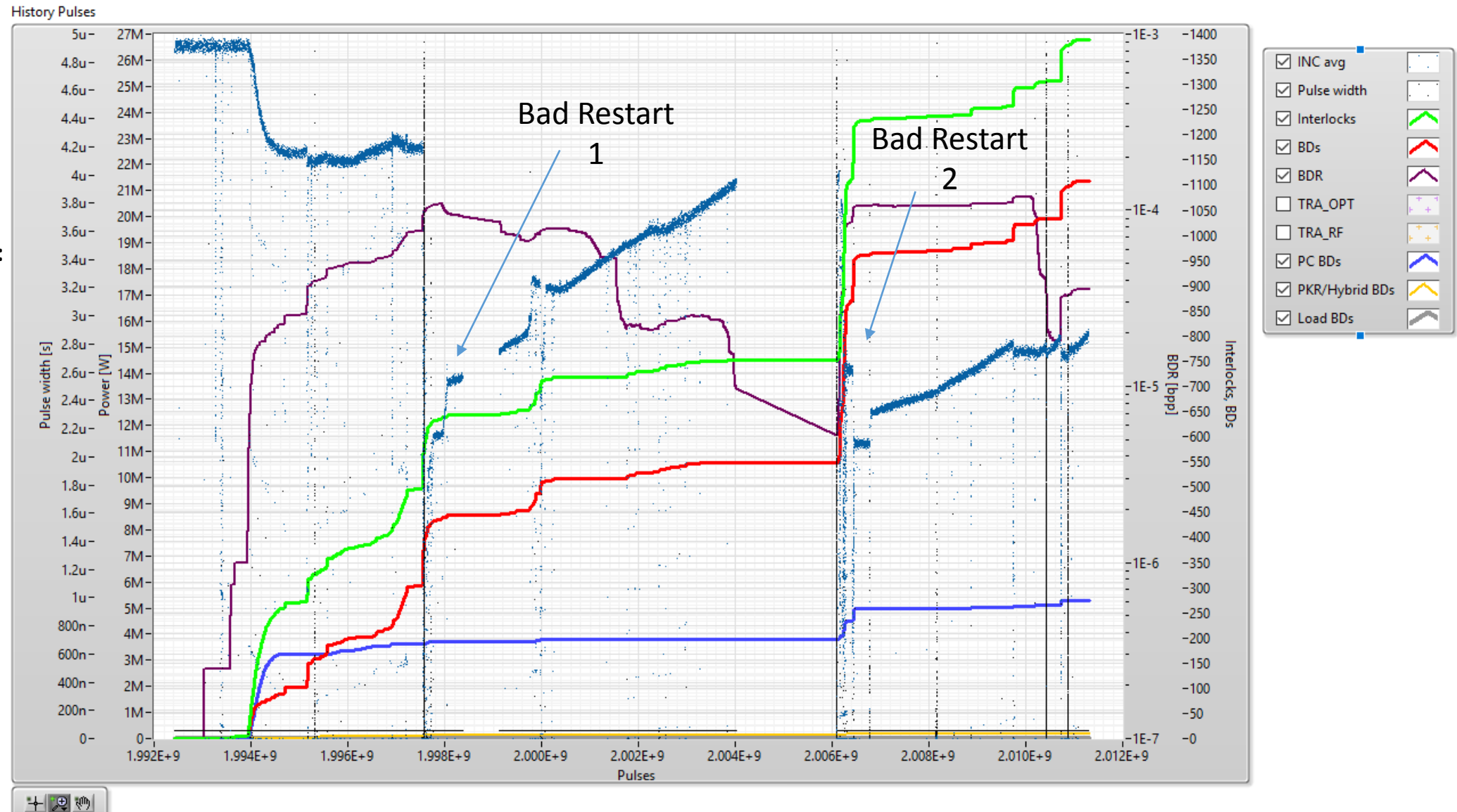
- 1.3us klystron pulse
- 50ns pulse
- 50Hz rep rate
- **Current Power:**
15.7MW



XBOX3 AB –Line 1 Pulses

Parameters:

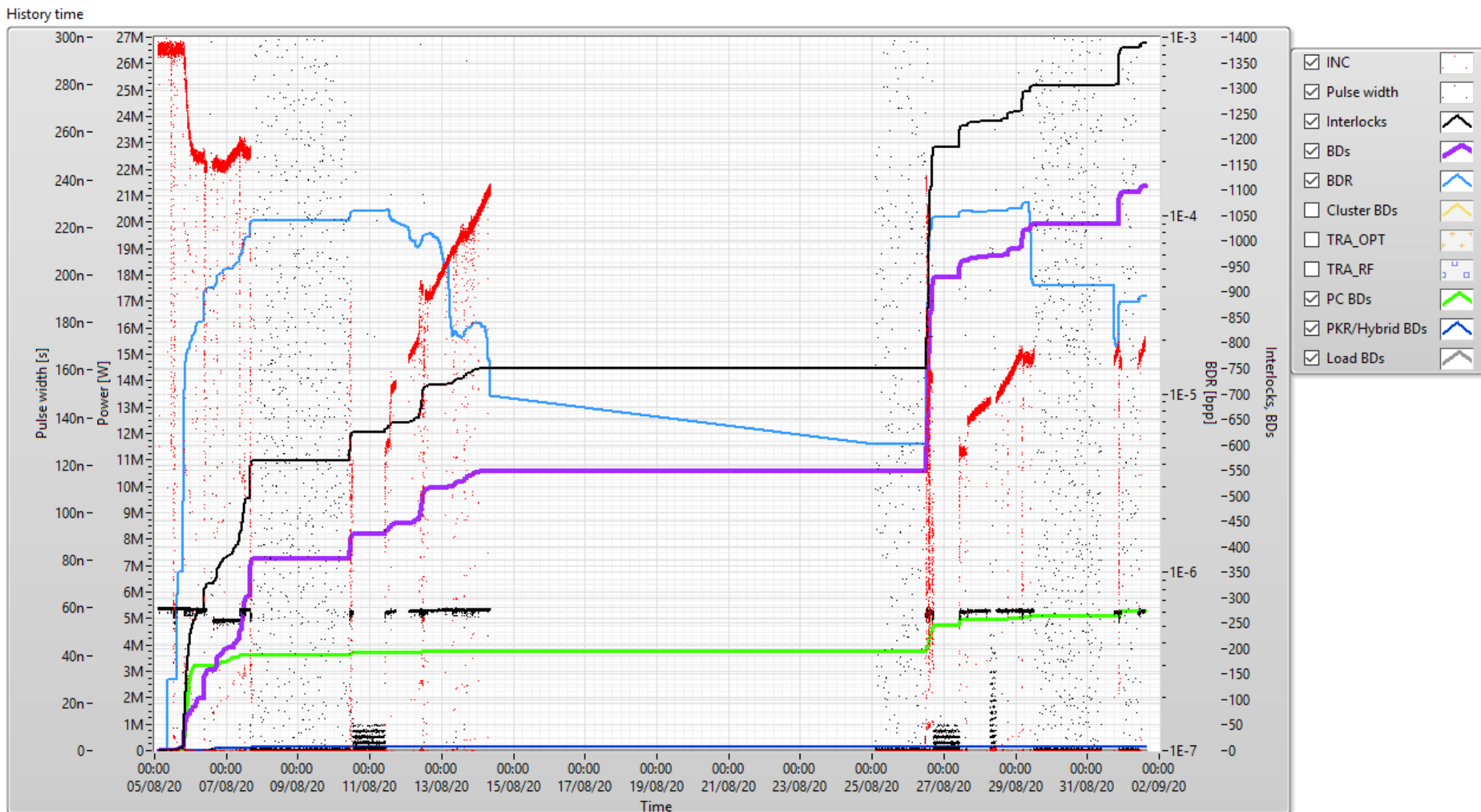
- 1.3us klystron pulse
- 50ns pulse
- 50Hz rep rate
- **Current Power: 15.7MW**



XBOX3 AB –Line 1 Time

Parameters:

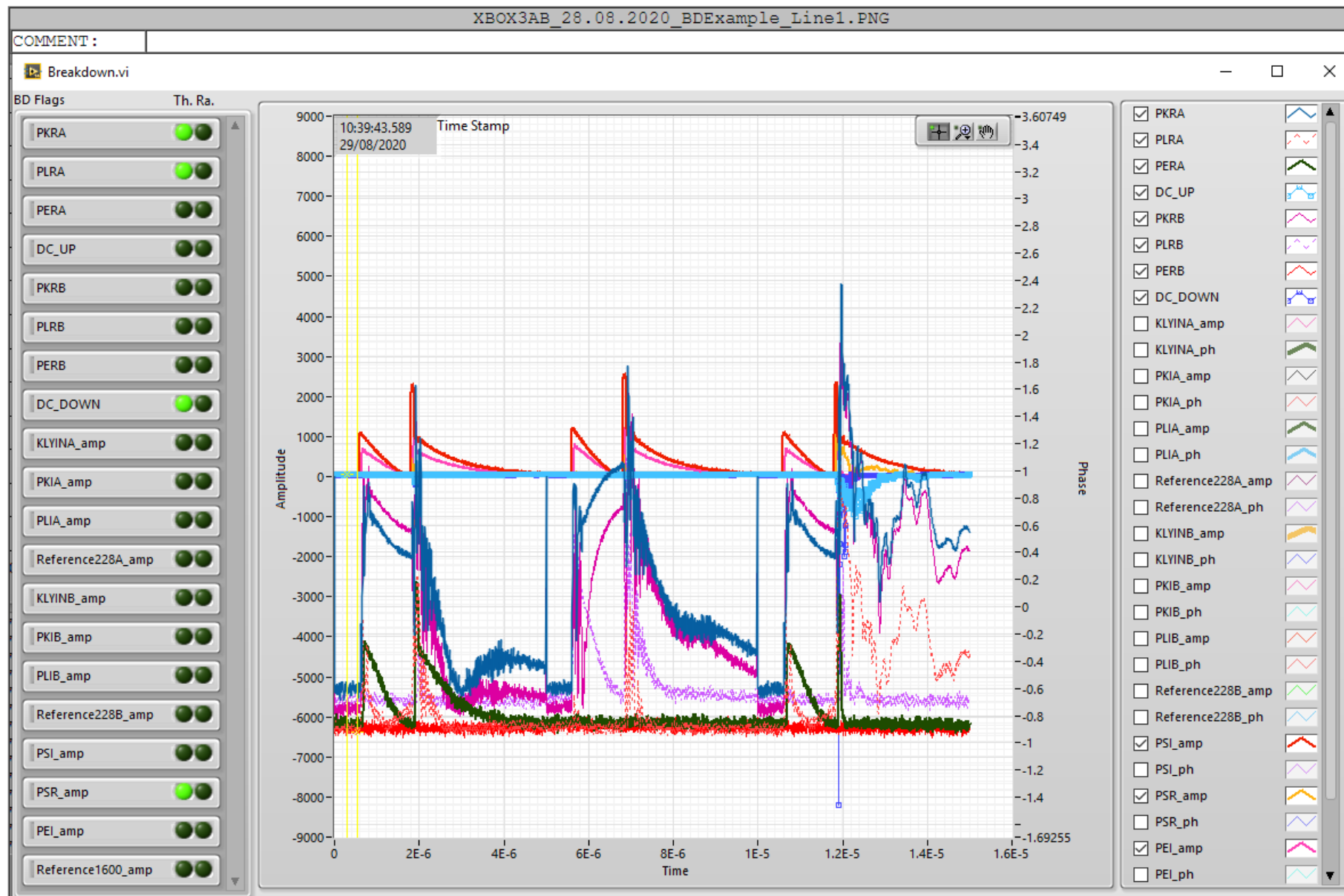
- 1.3us klystron pulse
- 50ns pulse
- 50Hz rep rate
- **Current Power: 15.7MW**



XBOX3 AB –Line 1 BD Example

Parameters:

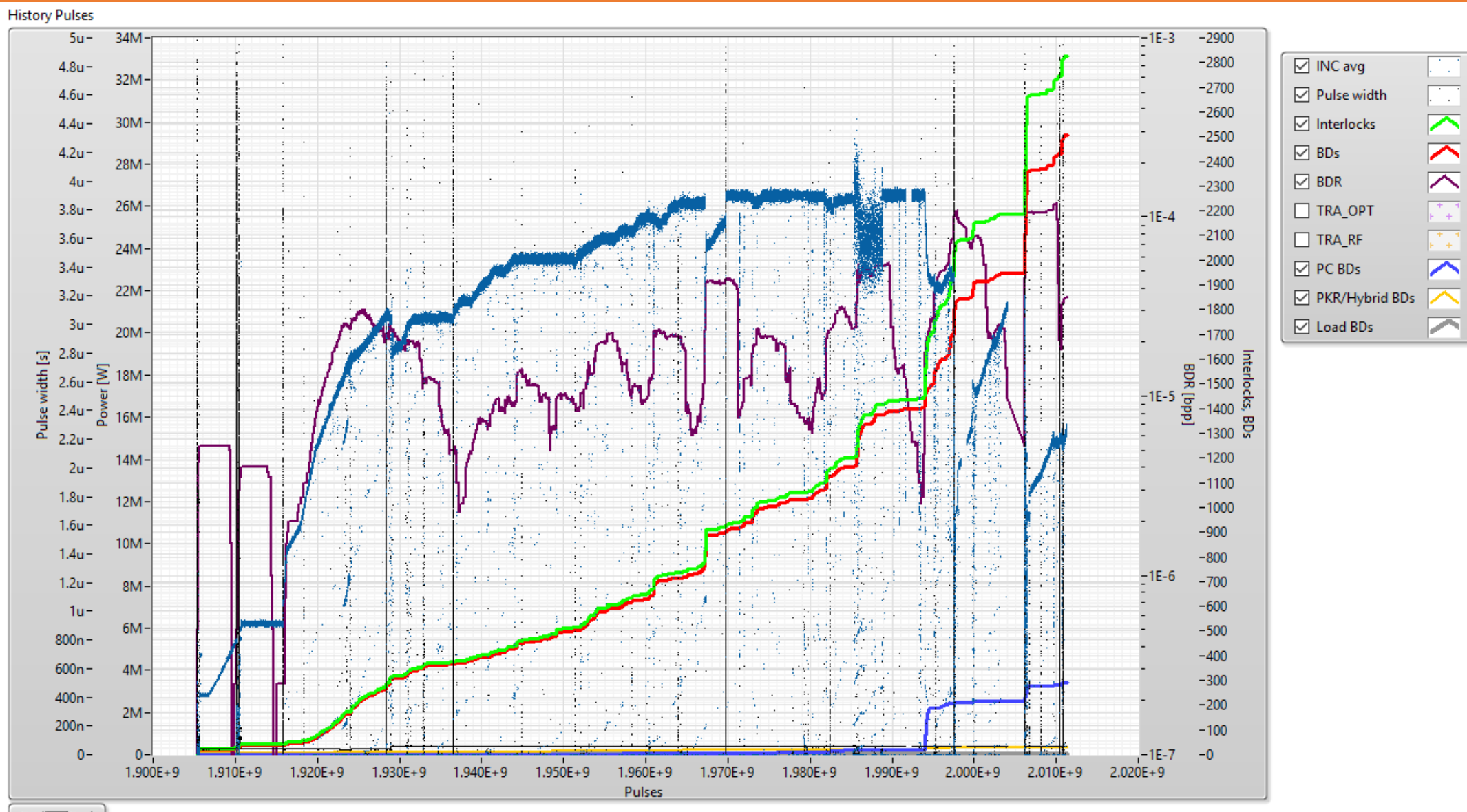
- 1.3us klystron pulse
- 50ns pulse
- 50Hz rep rate
- **Current Power: 15.7MW**



XBOX3 AB –Line 1 Full Reversed History

Parameters:

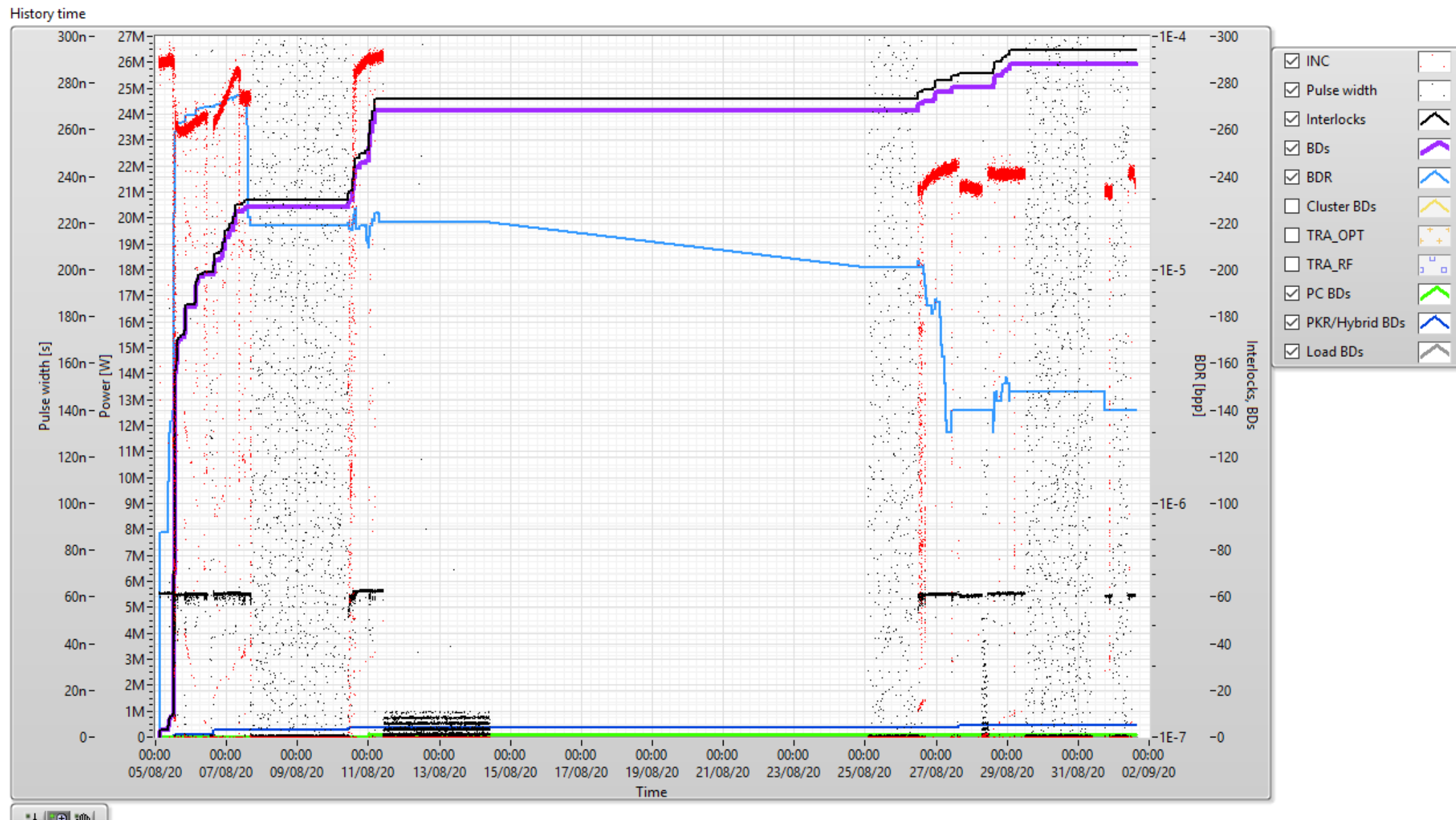
- 1.3us klystron pulse
- 50ns pulse
- 50Hz rep rate
- **Current Power: 23MW**



XBOX3 AB –Line 2 Time

Parameters:

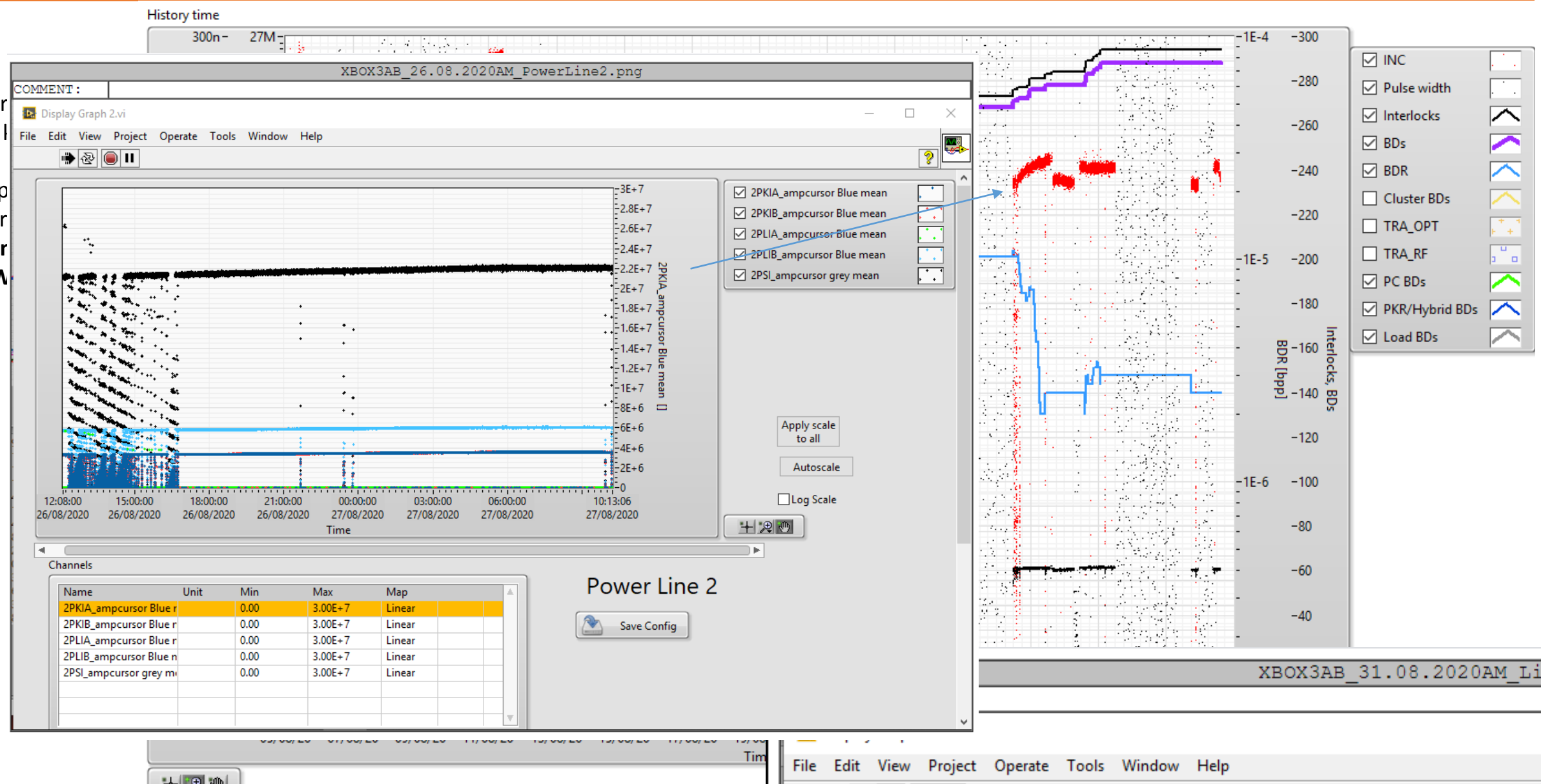
- 1.3us klystron pulse
- 50ns pulse
- 50Hz rep rate
- **Current Power: 23MW**



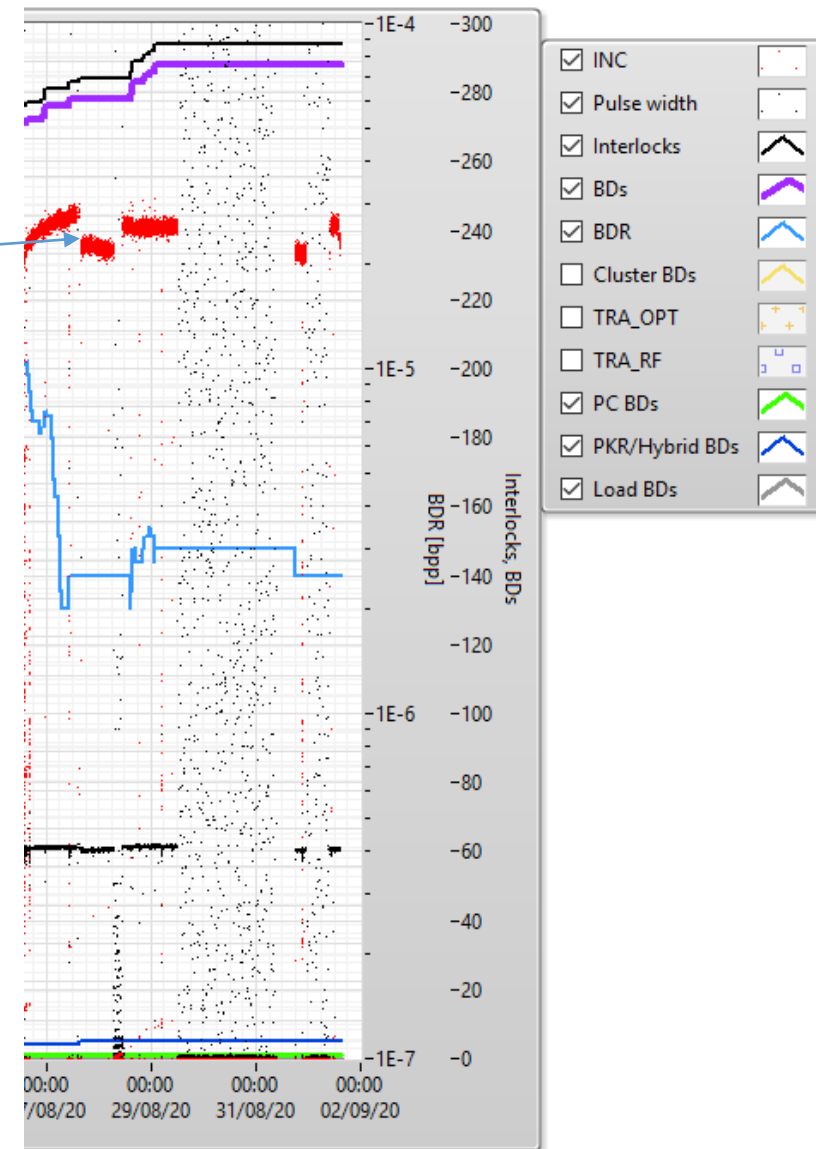
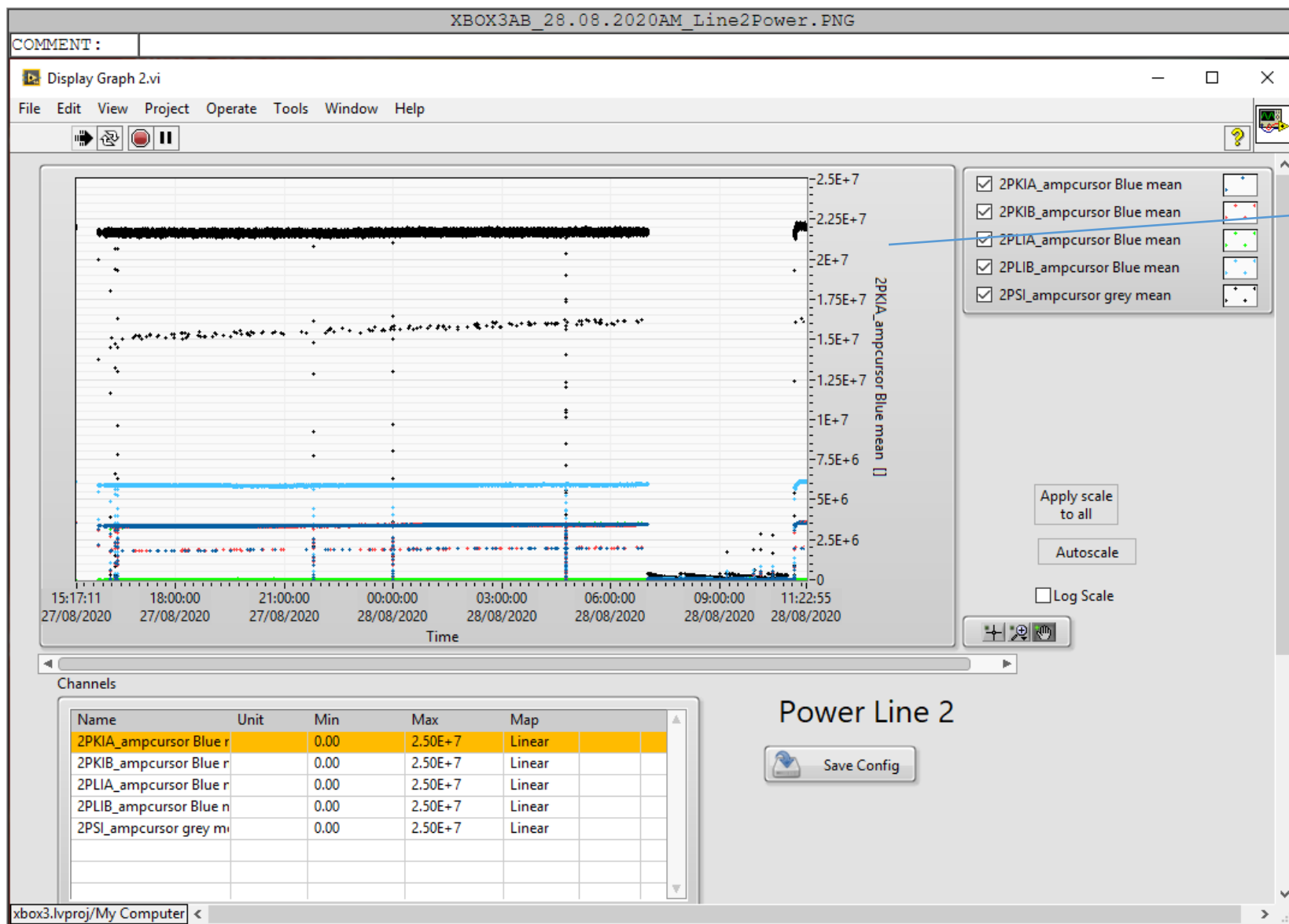
XBOX3 AB –Line 2 Time

Parameter

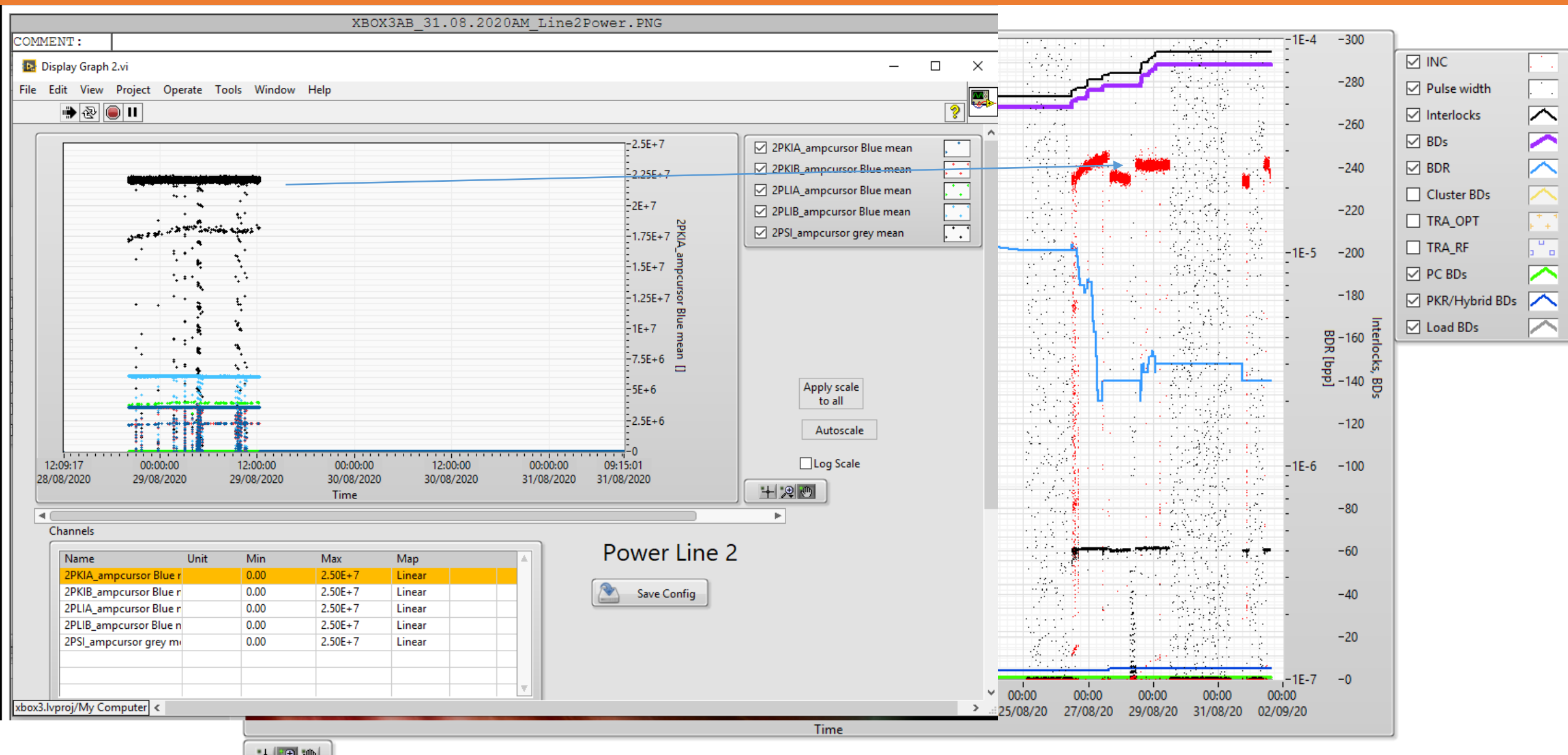
- 1.3us l
- pulse
- 50ns p
- 50Hz r
- Currer
- 23MW



XBOX3 AB –Line 2 Time



XBOX3 AB –Line 2 Time



XBOX3 AB –Line 2 Full Reversed History

Parameters:

- 1.3us klystron pulse
- 50ns pulse
- 50Hz rep rate
- **Current Power: 15.7MW**

