30 GHz Results

Walter Wuensch
Jose Alberto Rodriguez

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- Data acquisition
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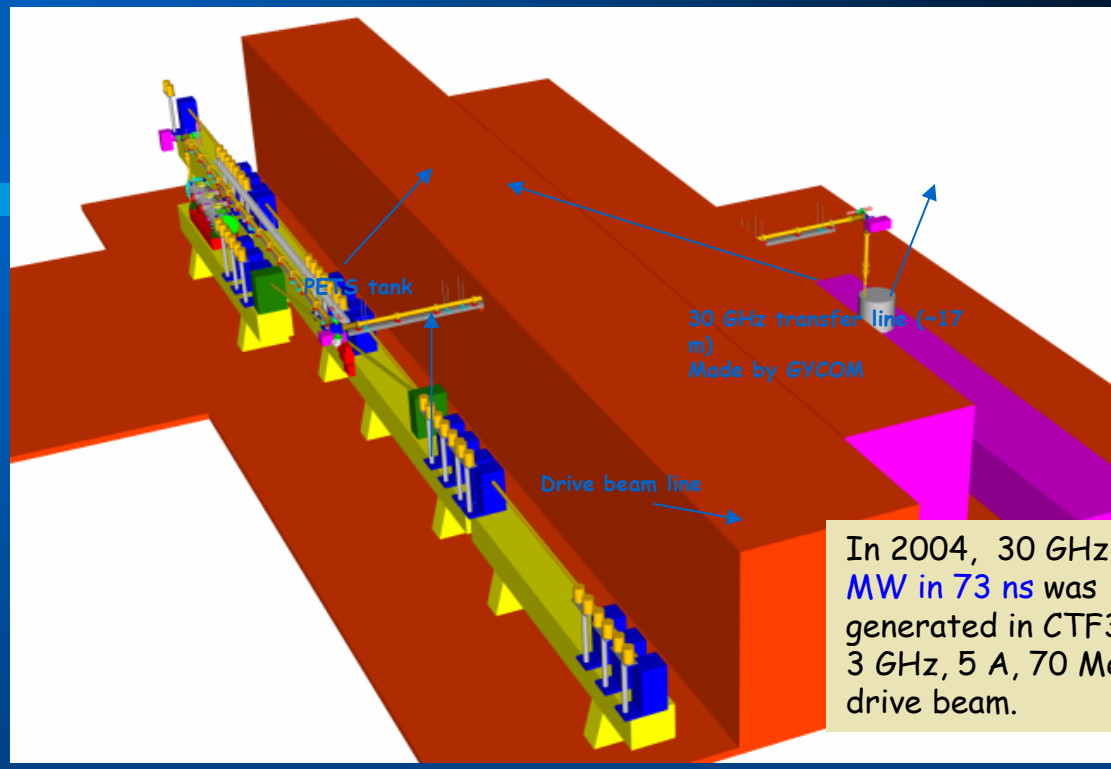
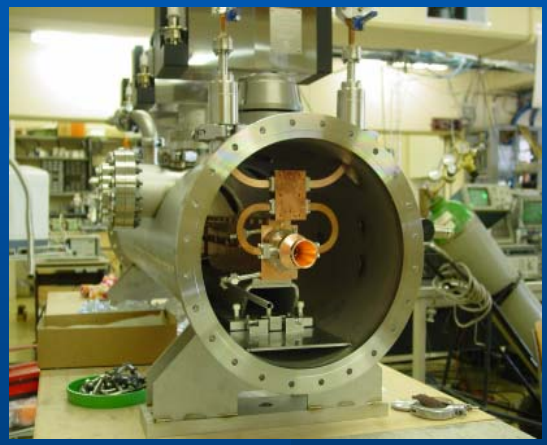
9 mm PETS cell

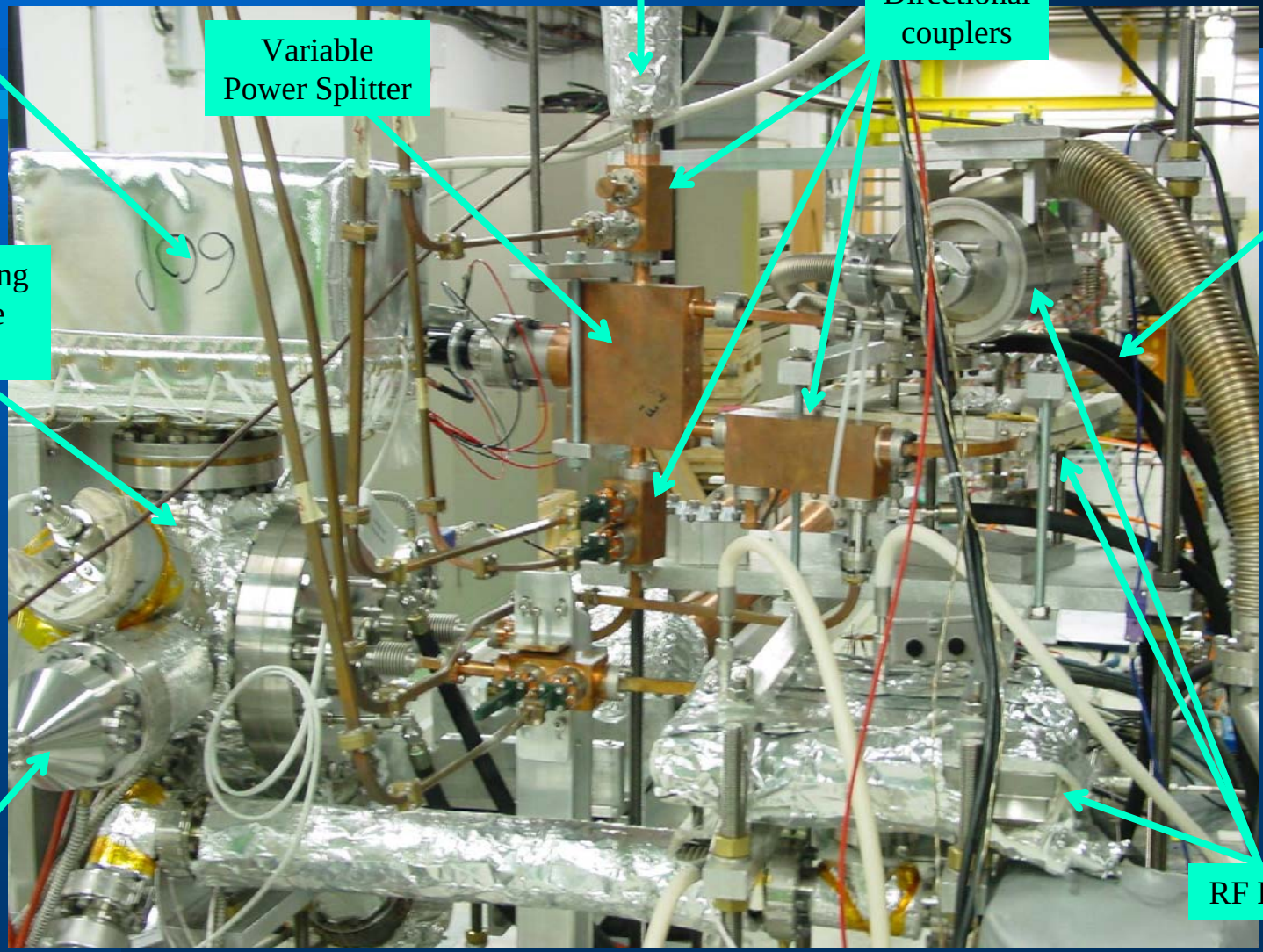


In 2004, 30 GHz, 72 MW in 73 ns was generated in CTF3 from 3 GHz, 5 A, 70 MeV drive beam.



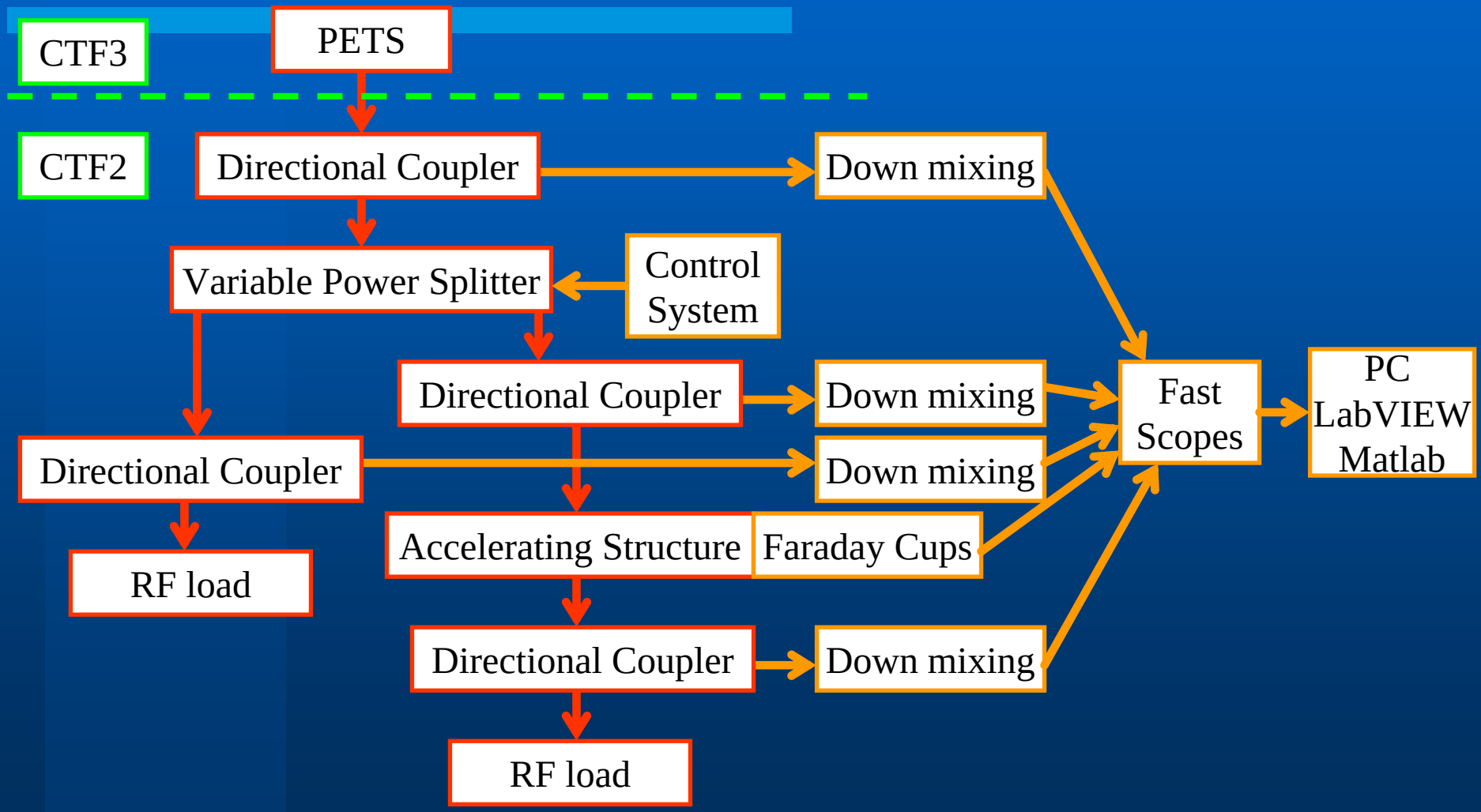
PETS tank in CTF3

30 GHz transfer line. Transfer Efficiency 85%.


RF Power from PETS
Ion Pump
Directional couplers
Variable Power Splitter
Cooling Water
Accelerating Structure Tank
Faraday Cup
RF Loads

Experimental layout

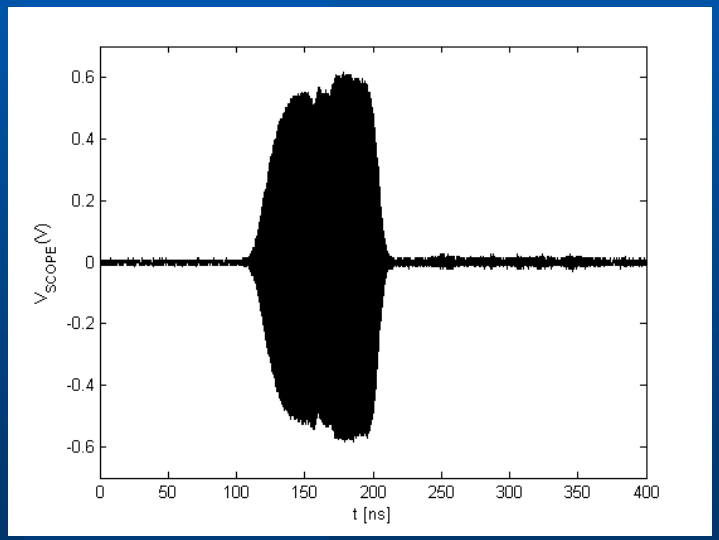
Data acquisition



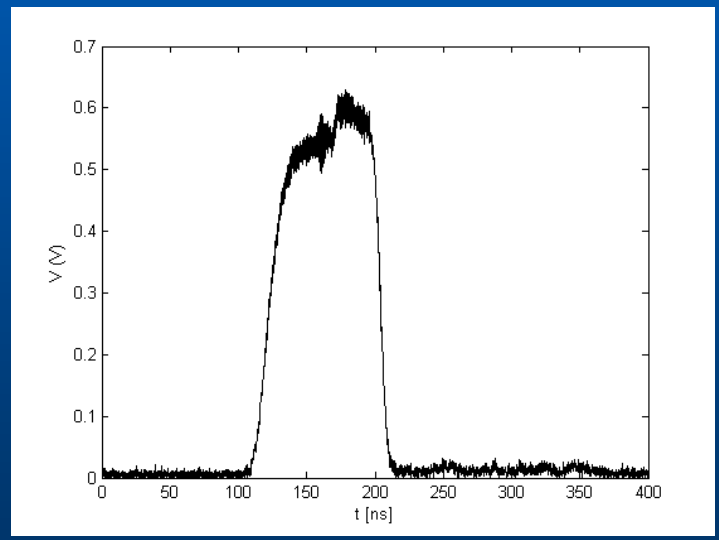
Definitions

Calibration

+

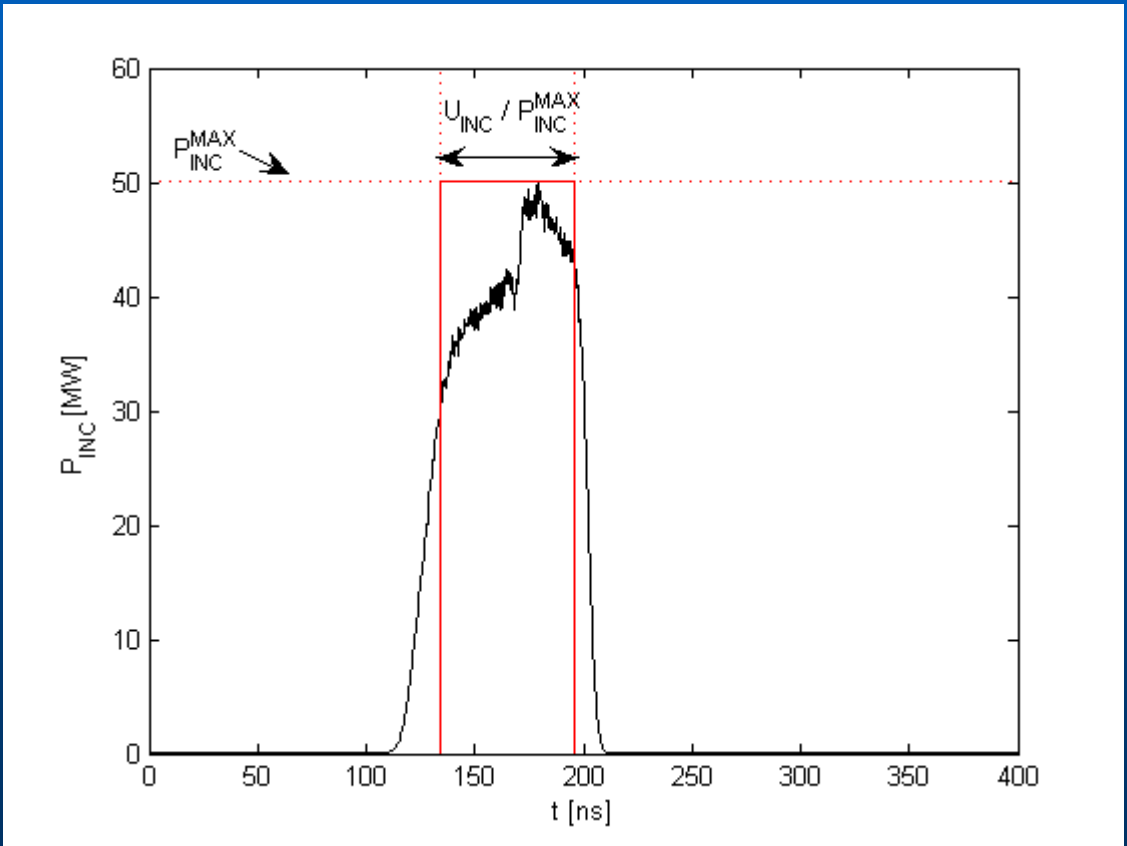


Digitized Pulse in Scope

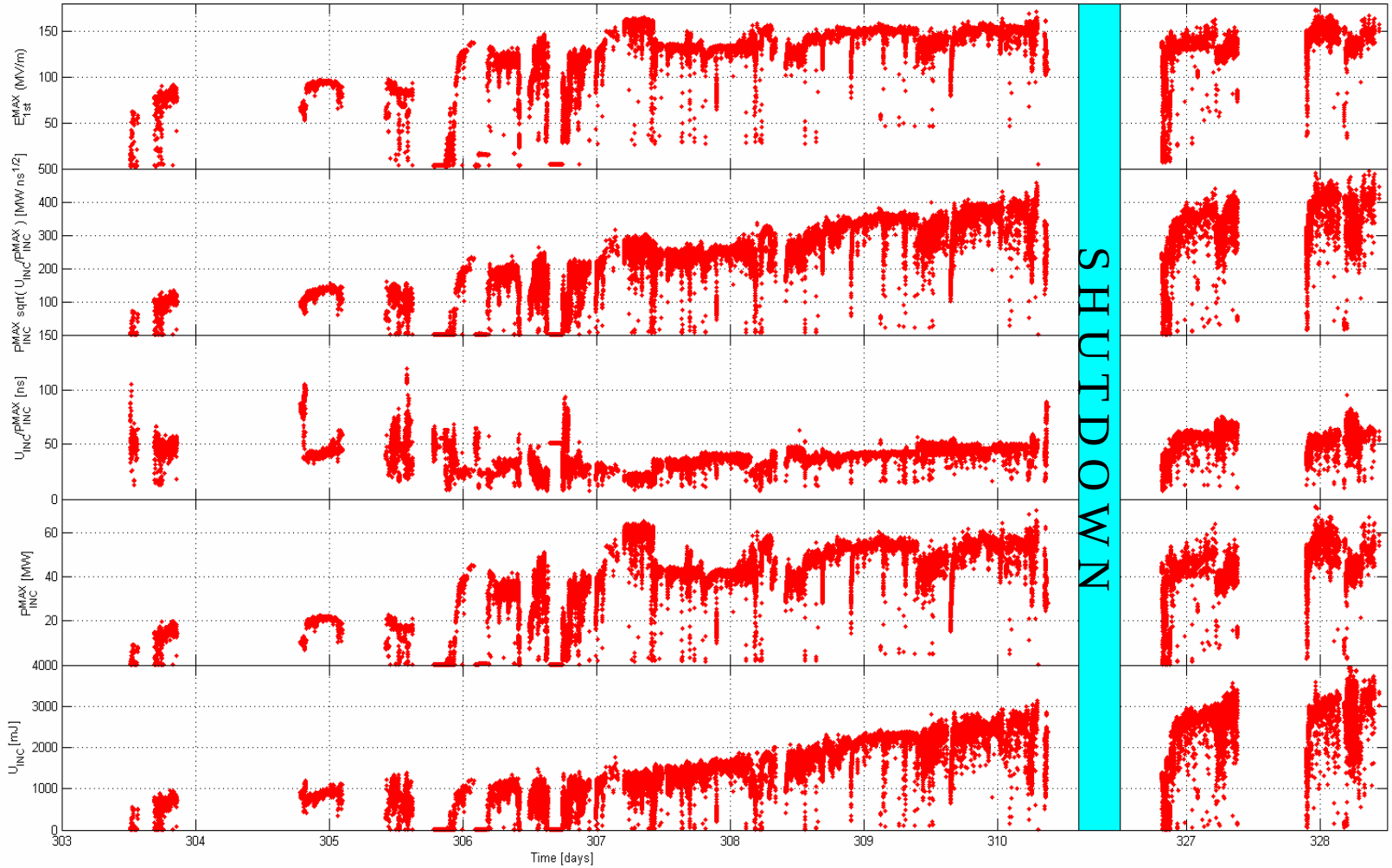


Pulse Envelope

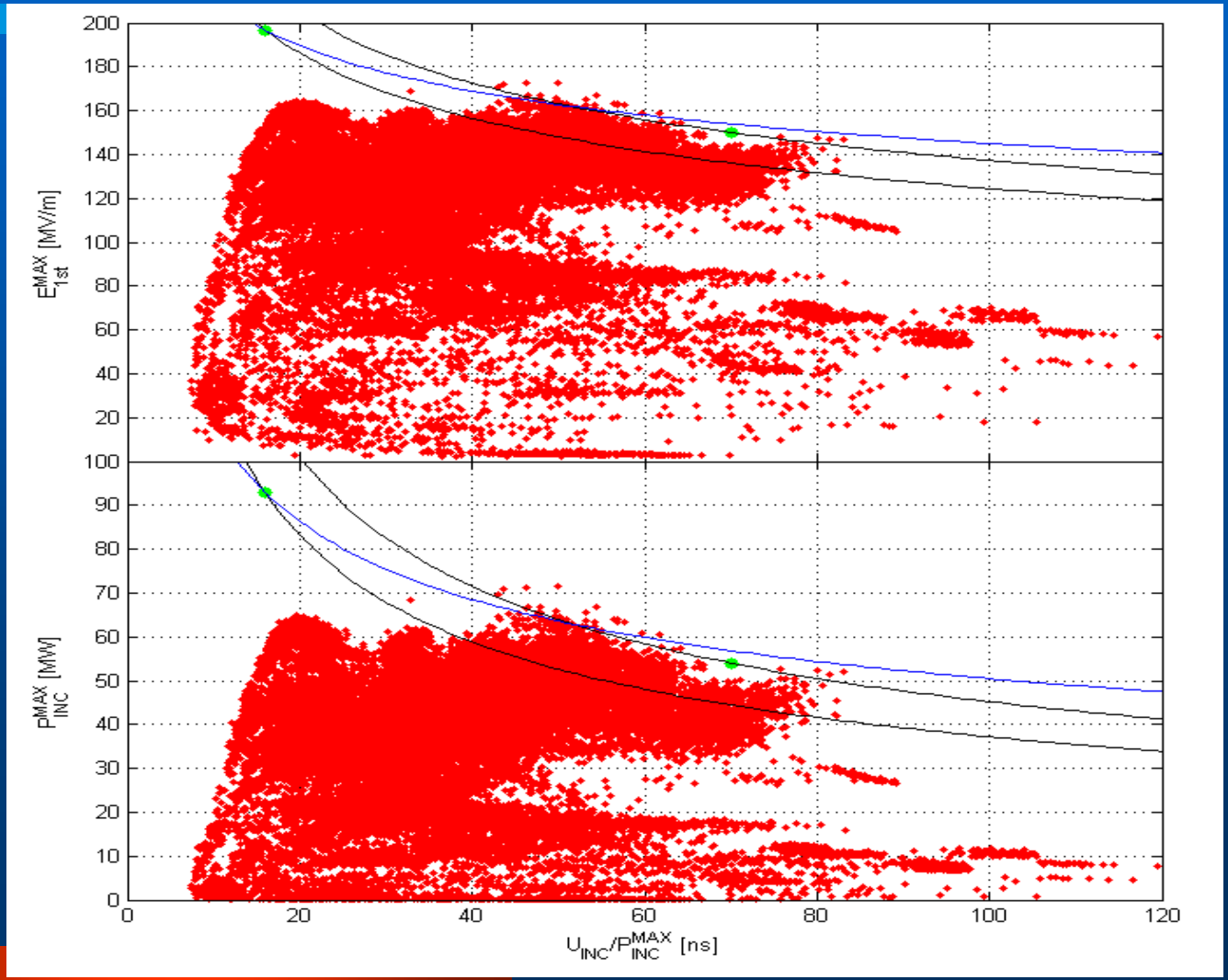
Definitions



Conditioning results so far



Conditioning results so far



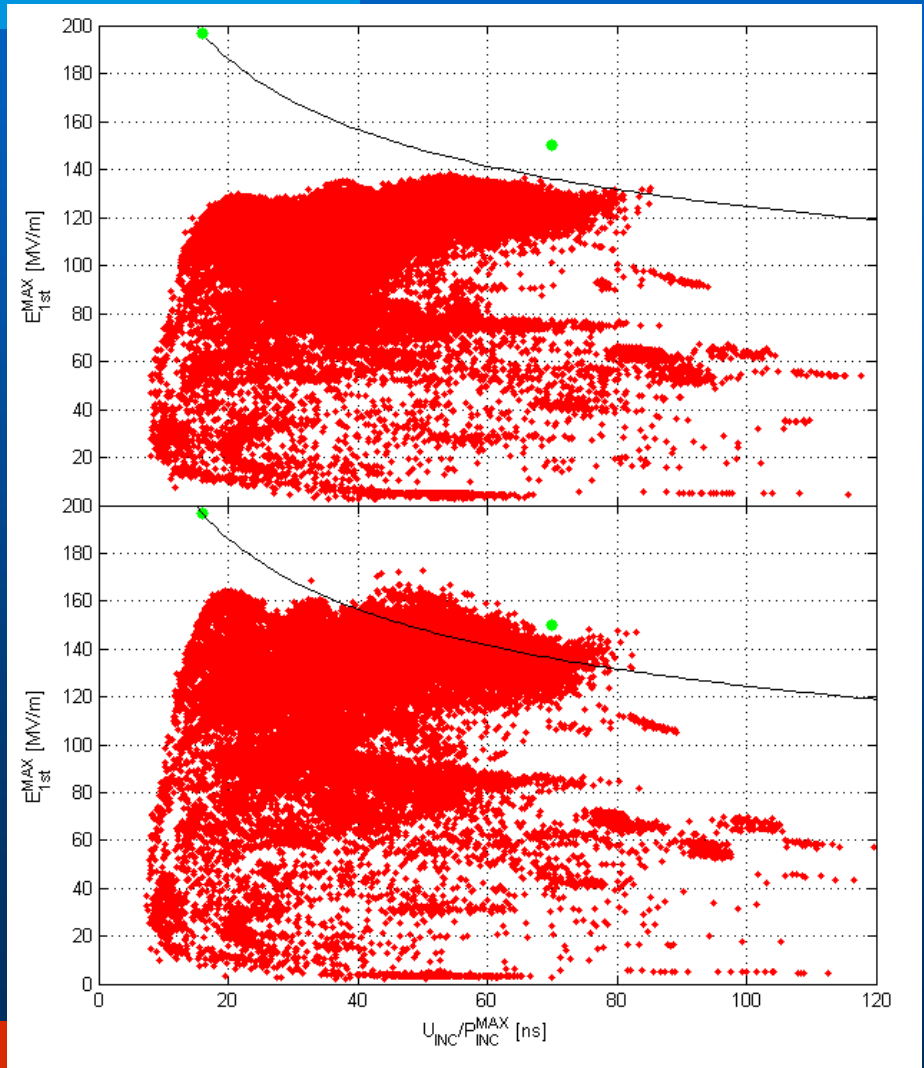
Issues to address

- **Precise Measurement of RF power**
- **Conditioning strategy**
- **Data logging**

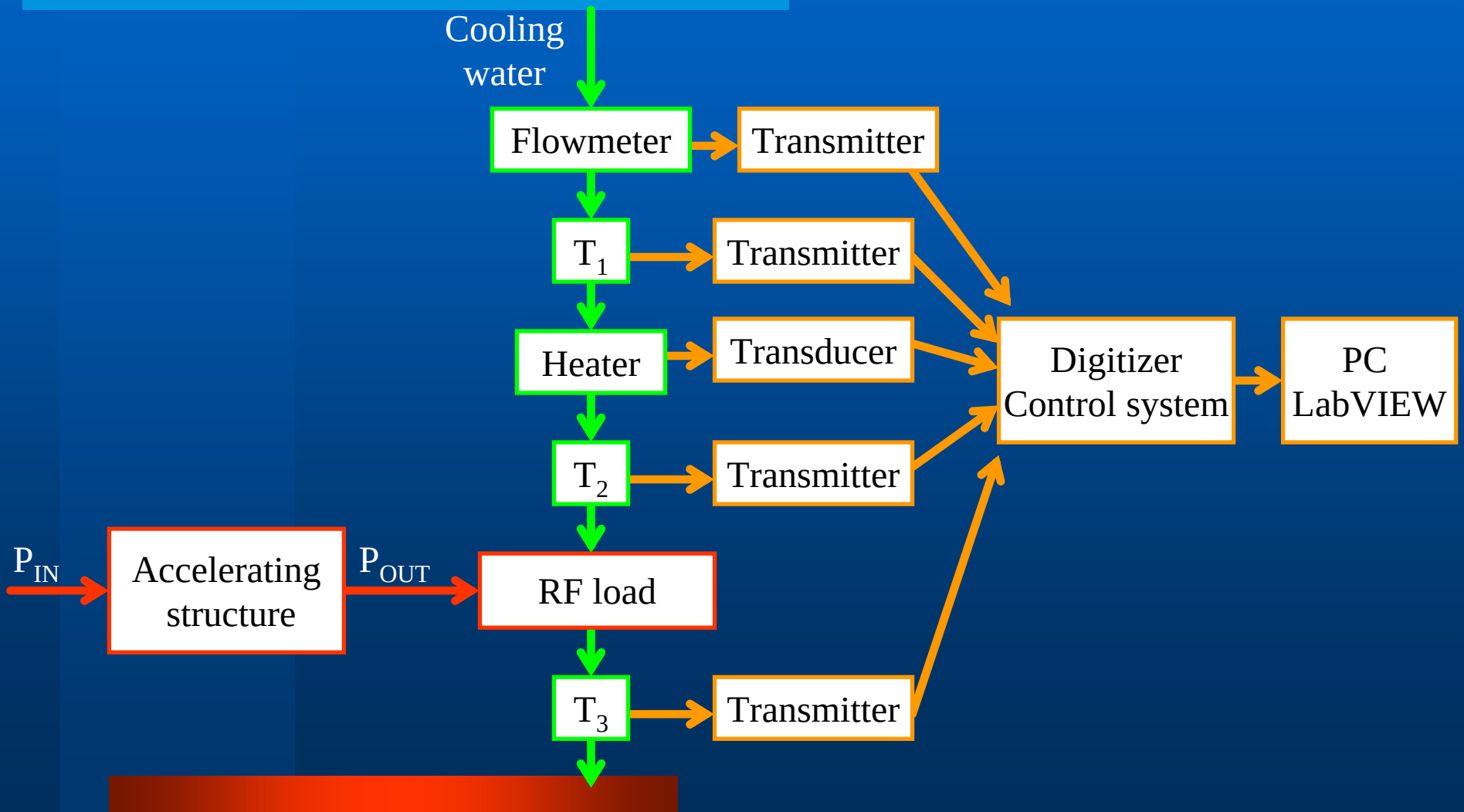
Calibration errors

From Transmitted Pulse signal

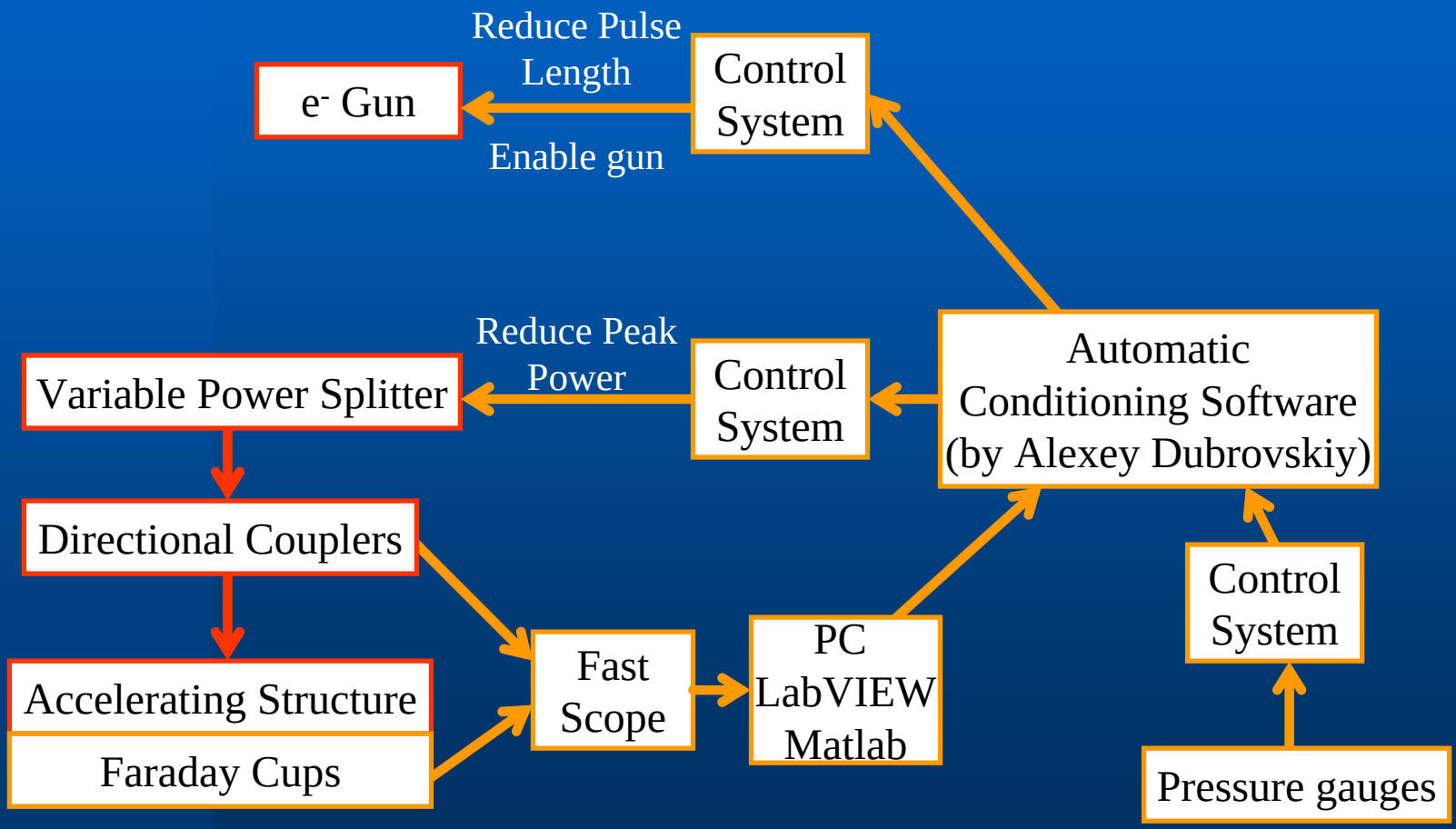
From Incident Pulse signal



Calorimetric measurement of power



Automatic conditioning Software



(To be upgraded next year)

To be done during the rest of the run

- Continue conditioning
- Breakdown rate measurements
- Peak power vs. pulse length measurements
- Long pulse conditioning of PETS
- Calorimetric measurement of power
- Commissioning of automatic conditioning software

Conclusions

- **Breakdown rate measurements must be and will be performed**
- **Shape of the pulse needs to be improved to eliminate uncertainties in pulse length and peak power definitions**
- **Calibration of power measurements needs to be improved**
- **CTF2 results for molybdenum structure have been reached (assuming P sqrt(T) = k dependence)**
- **1st cell gradients between 135-145 MV/m for 70 ns long pulses has been reached (still with very high breakdown rate)**
- **<u>Conditioning of the structure continues</u>**