PROTON DETECTOR DISCUSSION

CCFE, FIU, PPPL

**Attendance**
FIU: Werner Boeglin, Ramona Perez
PPPL: Douglass Darrow
CCFE: Rob Akers, Scott Allan, Vasili Kiptily, Ken McClements, Sergei Sharapov, Nigel Thomas-Davis

Comments in these boxes
We are using an unsealed Am241 source for our alpha source. For the noise testing, we have collected data from two channels (to compare LMR195 coaxial cable and Nuclear Ultra MM1150 coaxial cable). All cable lengths are actual lengths to be used during summer data collection and electronics installed in the same cubicle for summer data collection. Detectors are positioned under the reciprocating probe.
Alpha signal pulse = 1 Event

\[ E_\alpha \approx 3 - 3.5 \text{ MeV} \]

• Very fast
• Can be “slowed down”
• Larger signal

We plan to investigate the effect of different time differentiation constants on our pulse heights
Noise with Alpha source

\[ \pm 35 \text{mV} \]

8.6 \( \mu \text{s} \)

6.79e-03, 3.60e-02

6.80e-03, -4.27e-02
No Alpha source – Background Noise

Volts

Microseconds
No Alpha source – Signal during TF Trip Test
No Alpha source – Signal during NB
No Alpha source – Signal during NB HV Breakdowns
Signal during NB HV Breakdowns

Volts

Microseconds
Probe Head Orientation

- Original orientation
- Sensitive to vertical position/structure
- Difficult to compare with neutron camera

We want to compare simulations with Rob Akers
Probe Head Orientation Cont’d

- New orientation
- Sensitive to radial structure
- Closer to neutron camera views
- Need to adjust probe head design

We want to compare simulations with Rob Akers

/MAST_efit/gMAST_shot_26887.dat

\( Z \text{ (m)} \)

\( X \text{ (m)} \)

\( Y \text{ (m)} \)
## Proton Detector (PD) Timeline

| DATE RANGE                | GOALS                                                                 |
|---------------------------|                                                                      |
| March 11<sup>th</sup> – March 22<sup>nd</sup> | • PD noise testing                                                   |
| March 22<sup>nd</sup> – April 19<sup>th</sup>   | • Remote PD noise testing (FIU: Ramona, CCFE: Scott)                  |
| April 22<sup>nd</sup> – April 26<sup>th</sup>   | • Uninstall PD (CCFE: Scott)                                         |
|                            | • Take all equipment to Rory Conway for return shipping                |
|                            | by morning of April 25<sup>th</sup> (CCFE: Scott)                    |
| July 1<sup>st</sup> – July 15<sup>th</sup>      | • PD installation (FIU, CCFE)                                        |
| July 16<sup>th</sup> – July 26<sup>th</sup>     | • PD data collection (FIU)                                           |
| July 27<sup>th</sup> -End of campaign          | • PD remote parasitic data collection (FIU: Ramona, CCFE: Scott)      |
| End of campaign            | • Uninstall PD and take equipment to Rory Conway (CCFE: Scott)        |

Remote testing might continue until April 26<sup>th</sup>
END OF SLIDES

CCFE, FIU, PPPL
Silicon surface barrier detectors
Detectors connected to preamplifier (3m away), and amplifier/digitizer/PC system (12m away)
Please note that for the noise testing we have simulated all of these coaxial cable lengths