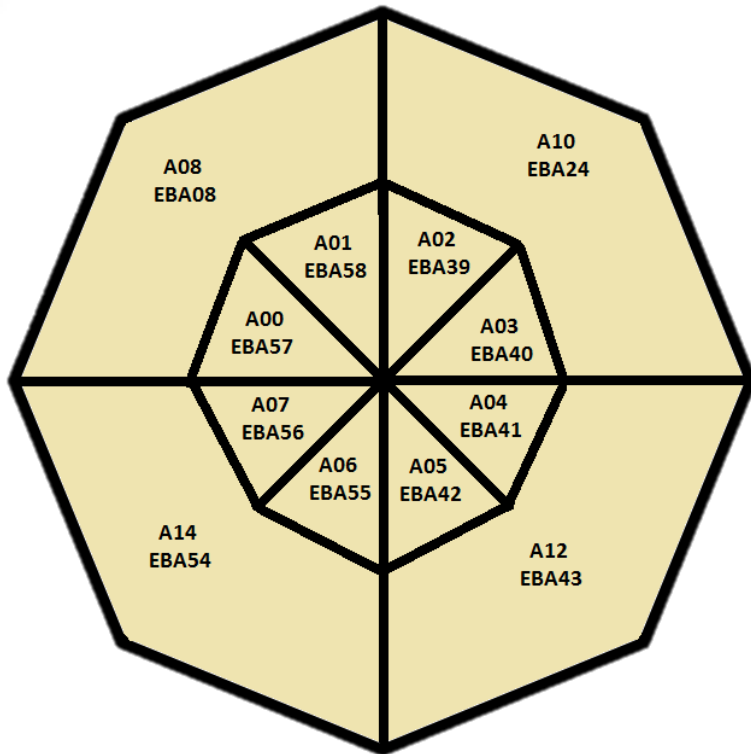


Run 2 Upgrade of the ATLAS Minimum Bias Trigger Scintillators

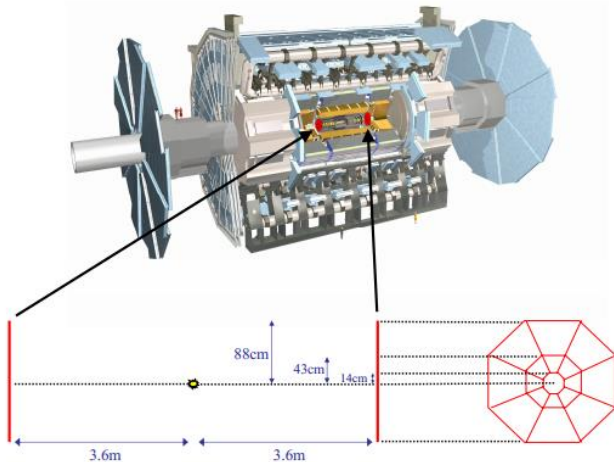
Rachel Hyneman, *College of William & Mary*

Advisor: Antonio Sidoti, *Istituto Nazionale di Fisica Nucleare*

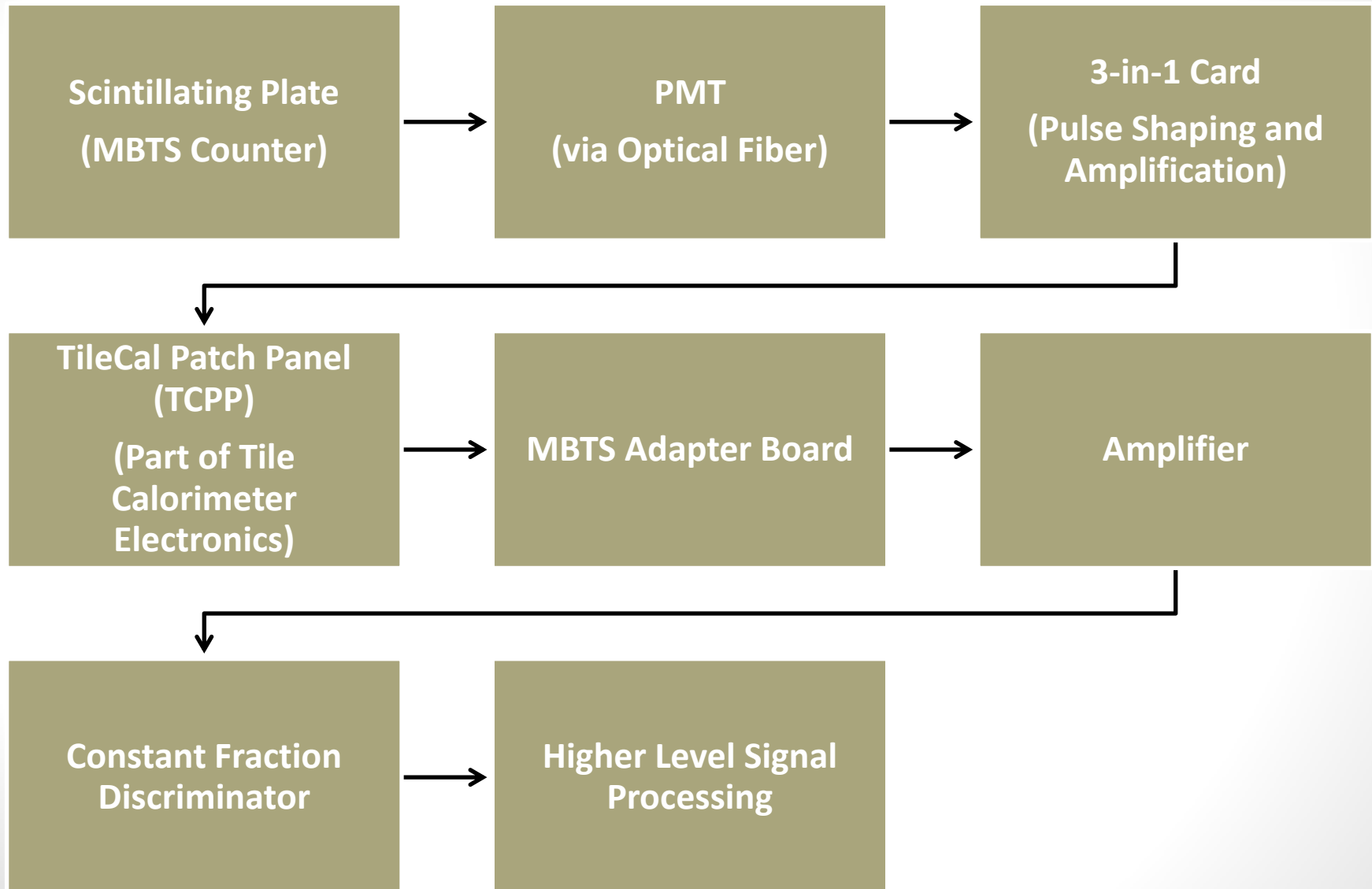
A Reminder...



- MBTS is a set of 12 scintillating plates on each side of the beam line
- Set up in concentric inner and outer rings, with 8 and 4 plates each respectively
- Electronics carry and process scintillator signal to Central Trigger Processor (CTP)
 - Includes basic coincidence checks
- Set-up acts as a trigger with low kinematic requirements



MBTS Signal Path

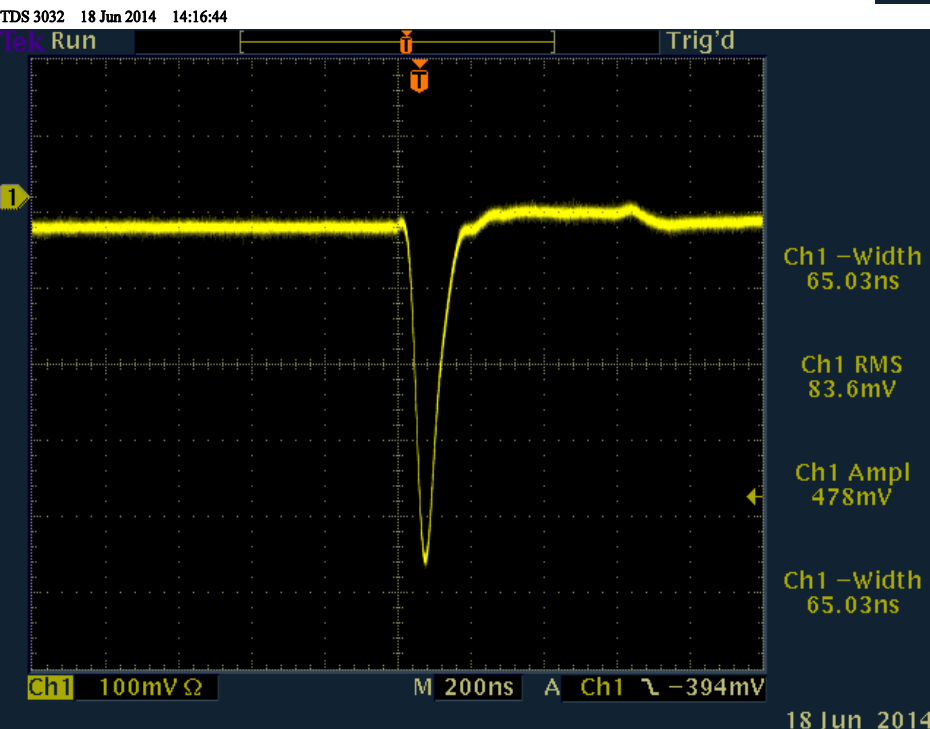
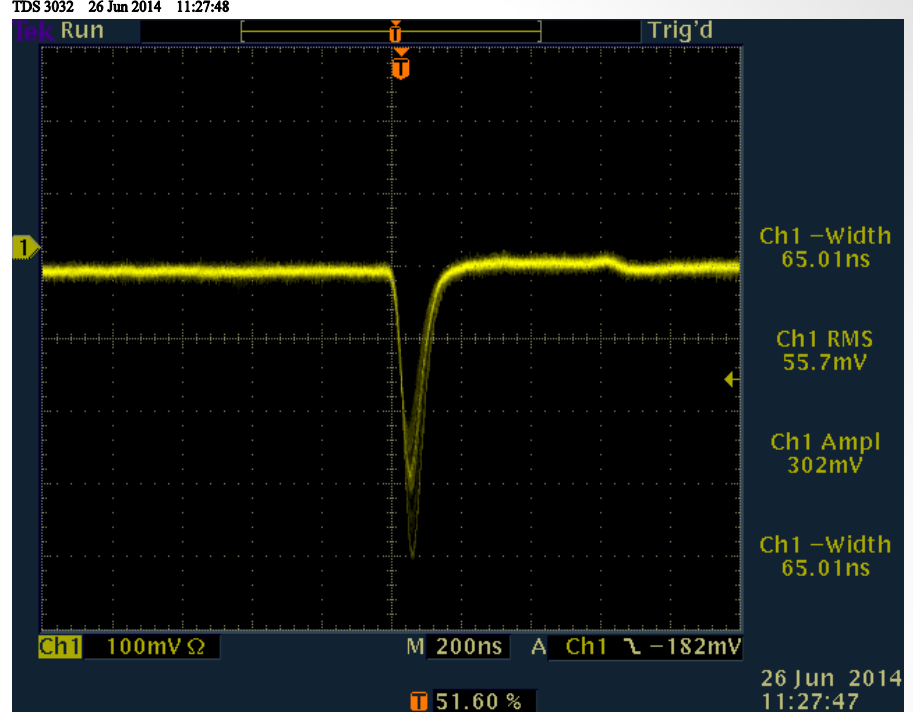


“To-Do List” Check-Offs

- Install new 3-in-1 Cards and Use different PMT's
 - Checked with direct injection of charge, then via laser pulse into PMT
 - Side A inner ring – not completed yet!
- Install CFD's
 - CFD's are in place
 - Voltage thresholds and output pulse widths have been set to be uniform, but not yet optimized
 - Determining the minimum pulse-separation for which CFD will fire on two separate pulses
- Check MBTS output connections to the CTP
 - All channels are working!

Visuals of Results

Some samples of scope traces

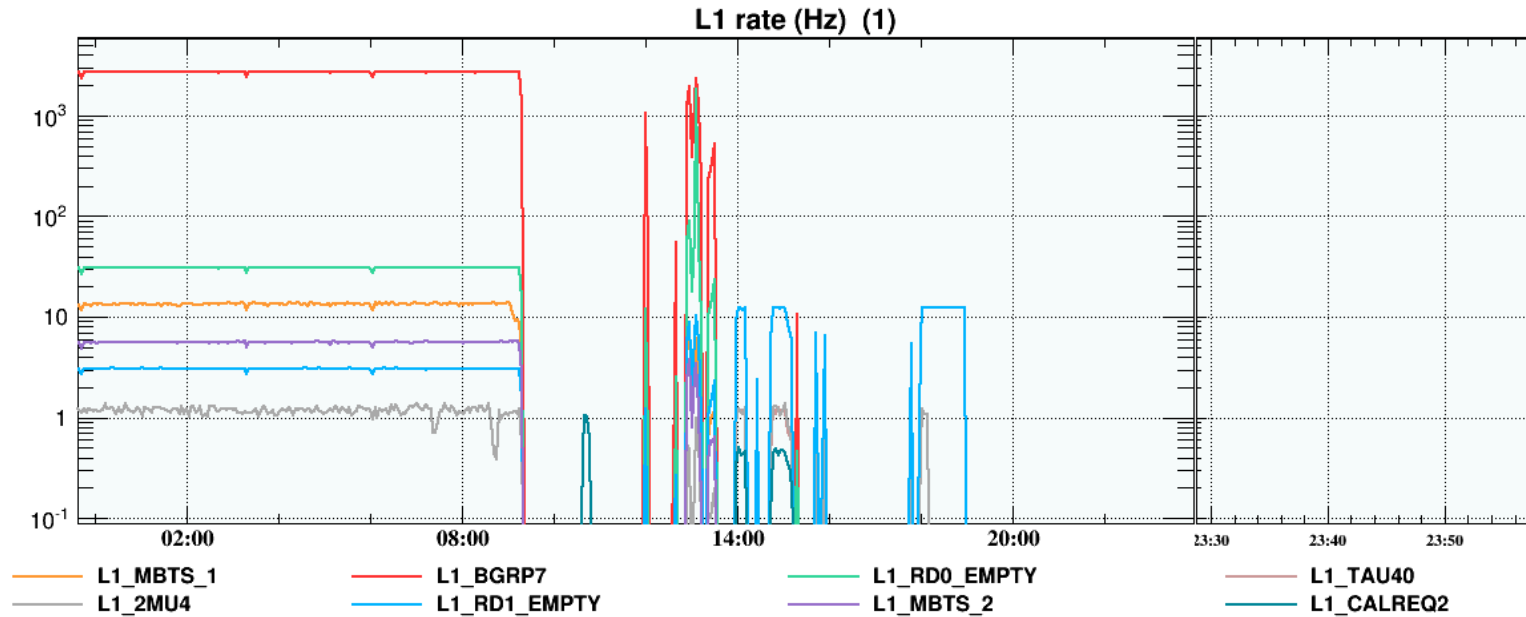


- Above: Sample trace from laser pulse testing
 - Side A, drawer EBA08
- Left: Sample trace from charge injection testing
 - (same drawer)

Still to Come

- Characterize CFD's further
 - Check minimum pulse separation using different pulse shapes, voltages and amplitude ratios
 - Optimize CFD delay parameter
 - (so far, ~32 ns appears to be optimal)
 - Optimize output pulse width
 - Optimize threshold for expected signal
- Analyze output from cosmic ray testing
 - (taken from M4 ATLAS Integration Week)
 - Need to learn TileMonitoring package in Athena
 - Compare outputs from 4 available channels
 - Each has different discriminator set-up

Visual of Cosmic Data



- MBTS data in purple (L1_MBTS_2)
- Can see that MBTS is firing successfully
- Further analysis to be completed...

Acknowledgements

Thanks to Oleg Solovyanov, Sabrina Sarecdoti and Thilo Pauly for help with electronics, software and CTP testing

Thanks for listening!

Tons of Funs!

Montreux Jazz
Festival and
Annecy, Fr

