

TOF Electronics Upgrade

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Current system

- 54 3m long scintillator bars 5cm x 5cm and 10cm x 10cm
- Particle ID from 1-3 GeV
- Achieves 180ps resolution on beam tracks
- Due to single-level trigger compelled to insert 150 ns of delay cable.
- This caused variations up to 2ns due to temperature changes in experiment hall
- Fitted and calibrated out – better to avoid
- Have 1/3 of tracks have earlier TDC than expected – superluminal
- Main suspect now is trigger, sending start too late
- Confirm trigger cause and fix for upgrade
- Also have 3 small squares of scintillator readout by 4 PMTs each in the beamline for start time and beam particle ID at low momentum

Proposal

- So far Nick Solomey and Holger Meyer have been working on the design
- Front end boards—TripT chip used by Minerva(ADC) and a high end TDC chip (used by LHC-b) 2 channels per chip with 30 ps timing resolution
- Will buffer an entire spill. Delay cables will be eliminated.
- Backend will use RICH VME readout card for ToF
- M&S \$16K Labor \$18K

Who?

- USC plans to carry forward its responsibility for the TOF system
- (Provided the DoE continues to approve this – likely)
- This would include upgrading the TOF electronics
- We will take a more active roll in the design of the electronics
- We welcome participation if other groups take an interest in the TOF