S2m and Plans for Coincidence Time of Flight

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Transversity Collaboration Meeting

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S2m Status Report

- S2m is installed in the LHRS detector stack.

- Working on tracking down missing cables:
  - 100 signal cables, 32 HV cables and 2 NIM power cables.
  - Cables were moved into storage (Warwick Storage).
  - On Friday, we went to retrieve the cables.
  - Recovered all but 16 ADC (50' long) and 32 HV cables.

- Remaining cables are possibly still in storage, though not in the same location.

S2m Status Report

- S2m Electronics Update:

  - Most of the electronics for S2m are available, though some modules are sparingly in use at the moment.

  - The modules needed for TDC and scalers are in place.

  - Missing a few logic units to form the trigger.

  - Purchase requistion was made to order needed modules and spares.

  - In the meantime, we can consolidate and borrow the RHRS S2m electronics.

  - Critical missing component is the **Electronic Deadtime Module Amp.**

  - How critical is electronic deadtime for Transversity?

Choice of TDC

Summary:

- All data to date have used fastbus TDCs for S2m.

- LeCroy 1875 with 50 ps resolution, though not multi-hit.

- LeCroy 1877's, multi-hit but 500 ps resolution.

- Rob Feuerbach had attempted to use F1 TDCs:
  multi-hit with 60 ps resolution.

- Rob indicated that the F1's have a large differential nonlinearity with the highest resolution setting.

Choice of TDC

Summary:

- Propose we keep the 1875's, but add a copy of the signals going to the F1 TDCs as a test during Transversity.

- Borrow F1 TDCs from BigBite hadron package.

- Need 32 channels for S2m and 12 for S1 and a few for other signals such as RF and coincidence times.

- Requires a VME64x crate, which none are currently available in the LHRS.

S2m Installation and Checklist

Installation Timeline:

- **July 31**: S2m cabled and components checked out.

- **August 1**: Verify S1 cabling and begin cosmic checkout.

- **August 22**: Complete set up of VME crate with F1 TDCs.

- **mid-August (?)**: Simulate coincidence trigger using an ETDM pulser to check timing (depends on BigBite readiness).

- **August 29**: Find ETDM Amp module or develop alternative method to measure electronic deadtime and test.

Coincidence TOF Preparations

- RF signal was included in TDCs for E08-007 in May run.

- Verified signal was present.

- Do we need a copy in the BigBite DAQ?

- For G_E^n, pulsed beam was also used:

  should we use pulsed beam for Transversity?

Coincidence TOF Preparations

- Check Coincidence timing and TOF using earlier data: SRC and G_E^n.

  - Becoming familiar with procedure and software.

  - Check resolution obtained with S2m: SRC (457 ps) and Pentaquark (600 ps).

  - Identify any bottlenecks in timing resolution.

  - Goal: complete by mid-September.

  - Manpower: C. Dutta and Y. Wang.