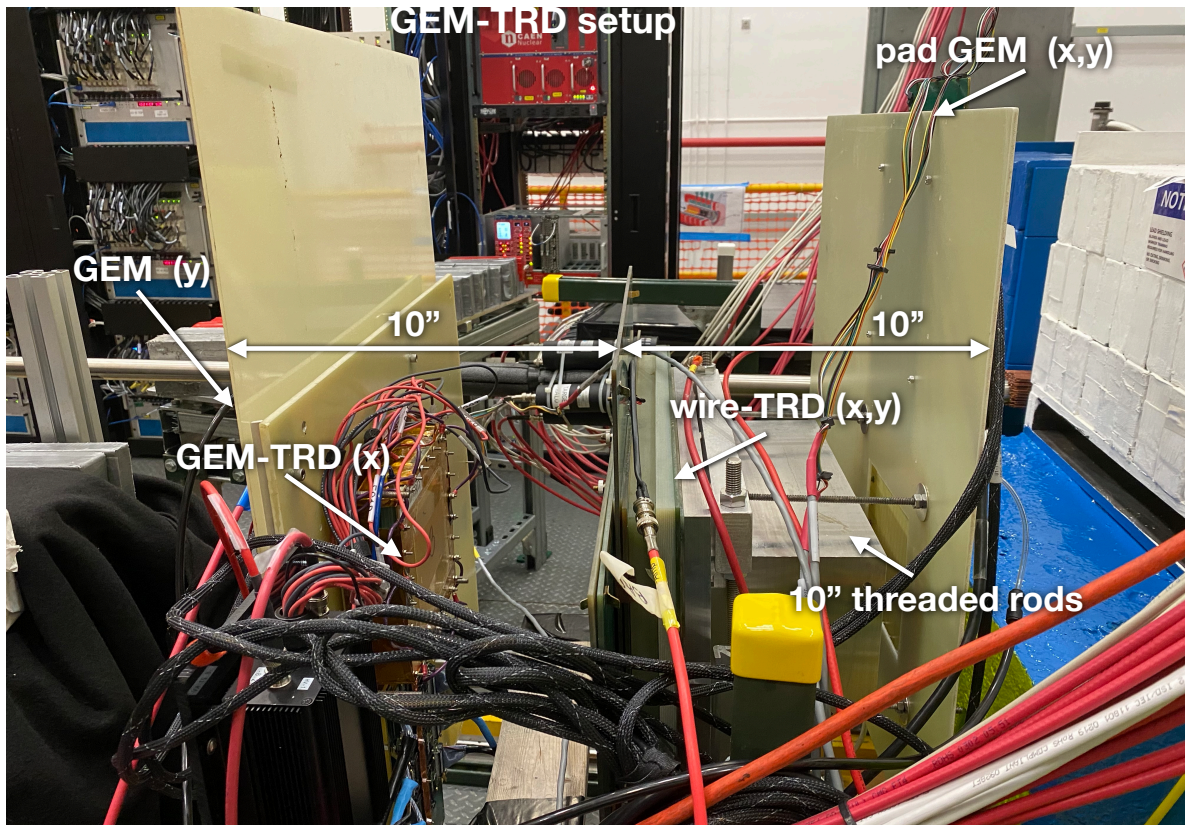


Plan for a test with the GEM-TRD tracker in from of the DIRC during the summer 2020 run

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The purpose of the test is to provide tracking information, both position and angle, right in front of the DIRC to help evaluating the track extrapolation and DIRC performance. The GEM-TRD detector package is currently tested at the beam-left PS arm and consist of a pad GEM detector, wire-TRD, and pair of high resolution GEM detectors (GEM-TRD and regular GEM) at the downstream side:



GEM-TRD CONFIGURATION

The support of the upstream detector will be extended to have 1 m leverage. The pad TRD has <1 mm resolution in both, x and y. The two

downstream GEM detectors, oriented x and y, have 0.1 mm resolution. The wire-TRD has resolutions of 2 mm in x and 0.6 mm in y. An important difference from the December 2019 test is that all the detectors are readout with our fast electronics, flashADC125, allowing to run the DAQ at the standard GlueX rates. The GEM-TRD tracker will give better than 1 mrad angular and 0.1 mm position resolution in both, x and y directions.

Once installed in front of the DIRC the tracker will require alignment using no-field straight tracks which will be combined with the standard no-field run needed for the GlueX chamber alignment (one shift). We need three shifts for the test itself, with the DIRC and field on, using the standard GlueX running conditions. In addition we ask for 4 hours data taking in raw mode needed to test the performance of the TRDs with two gas mixtures (Ar and Xe). All the tests will be done in one position of the GEM-TRD package - beam right.

The plan is to combine the installation of the GEM-TRD detectors with the installation/deinstallation of the CPP setup as follows:

1. The day of the CPP installation (10 hours that includes CPP):

- A. Disassemble, move and install in place (in a rack next to the FDC chiller) the electronics:
 - 1 VXS crates with modules
 - 1 NIM crate with modules
 - 21 signal cabling, 6 HV cables, 8 LV cables
 - disassemble only: the preamps on the detectors
 - test the electronics and DAQ without being connected to the detectors
- B. Disassemble the detectors from the frame
- C. Reconnect the gas lines that are already installed and reach the downstream side of the magnet
- D. Work on the mechanical modification: extending the support for the upstream detector and modification of one G10 plate

2. The day of the CPP deinstallation (8 hours including CPP)

- A. Start ramping down the magnet just before the work starts
- B. Once the CPP platform is removed install the detector frame in place:
 - Modify the holes on the platform and attachment to the Al bar, to allow more space between DIRC and the most downstream GEM

- Install the frame
 - Install the detectors
 - Connect the electronics and perform connectivity test with the DAQ
- B. Move DIRC in place
- C. Move FCAL in place
3. No-field run (8 hours) - perform standard GlueX no-field measurements with 50nA on 10^{-4} radiator.
4. Rump up the magnet (8 hours). Other tests are possible at this time that don't need the magnet.
4. Field-on runs (24 hours) - using the standard GlueX running conditions at 150nA (?) and 350nA or whatever is needed to for the DIRC test
5. Additional test of the TRDs with two gasses (4 hours) using raw mode
6. Deinstallation - just move the whole GEM-TRD setup away from the acceptance (3 hours).