

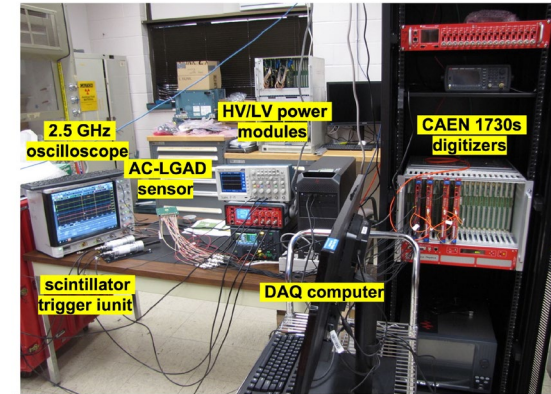
LANL FY24 plan for eRD112

Eric Renner, Xuan Li on behalf of the LANL team
Los Alamos National Laboratory

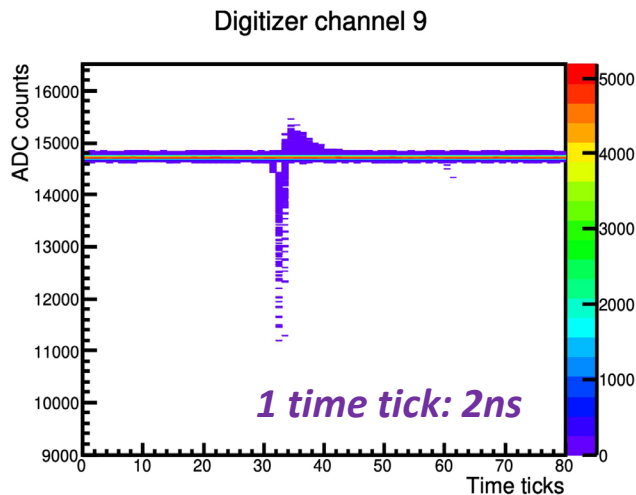
AC-LGAD bench test highlight at LANL

- Single sensor or multiple layer telescope ^{90}Sr source tests have been conducted at LANL.
- Plan to perform the characterization with new AC-LGAD sensors (wired bounded to the 16CH carrier board).
- Current setup utilizes the CAEN digitizers, open to work on the ASIC readout developed by the eRD112 group.

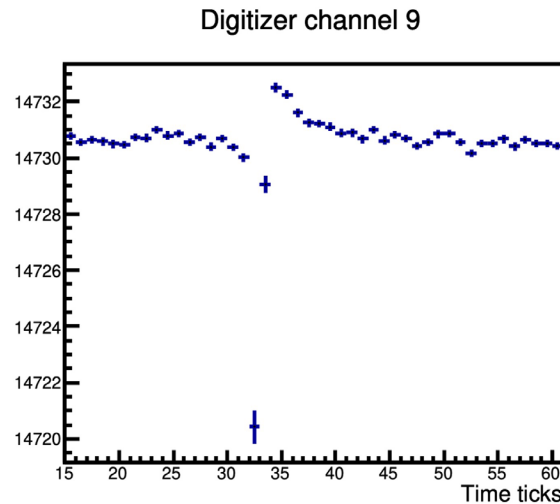
AC-LGAD ^{90}Sr bench test at LANL



Single pixel digitized output in ^{90}Sr source tests

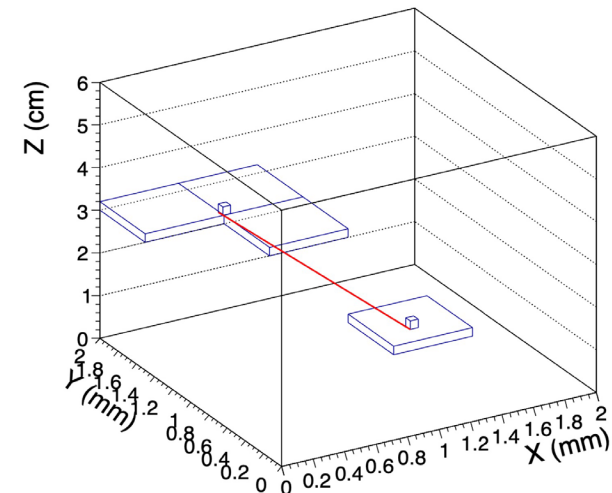


Averaged digitized ^{90}Sr signal



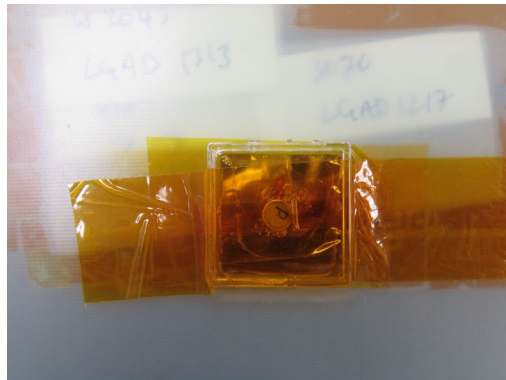
Event display of the telescope ^{90}Sr source tests

Event display 16



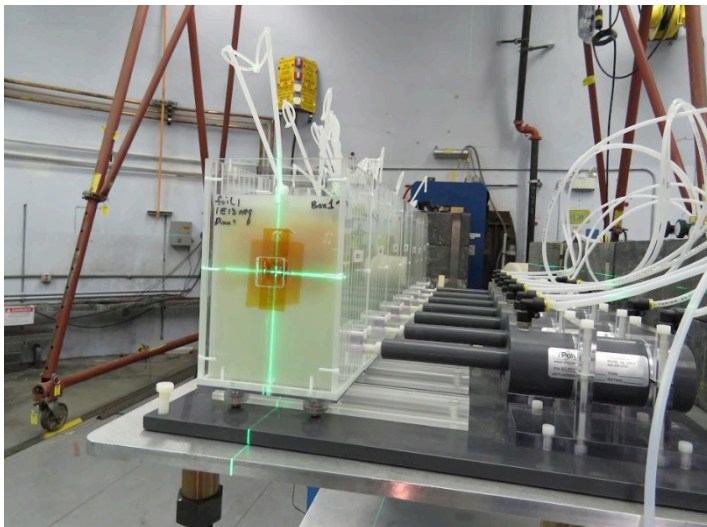
Irradiation tests at LANL LANSCE

- 8 groups of LGAD and AC-LGAD sensors/diodes have been tested at LANL LANSCE with 500 MeV proton beams.
- Pending access approval to ship the samples to BNL.
- The radiation doses are from $10^{13}n_{eq}cm^{-2}$ to $10^{16}n_{eq}cm^{-2}$.



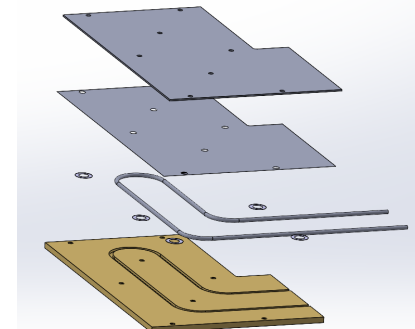
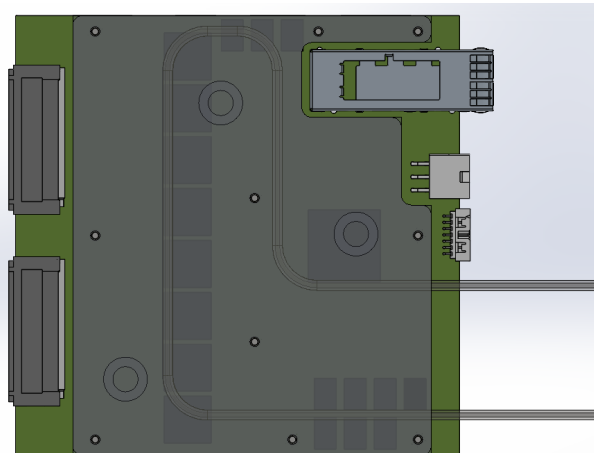
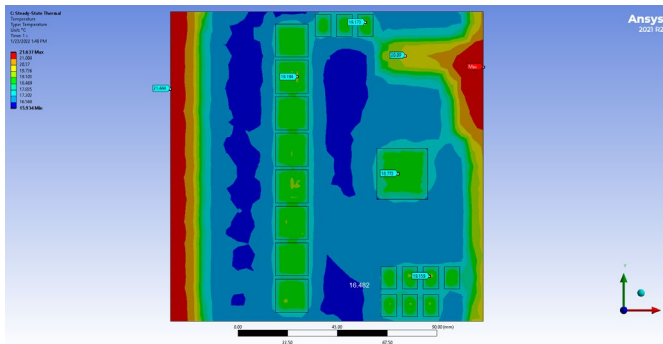
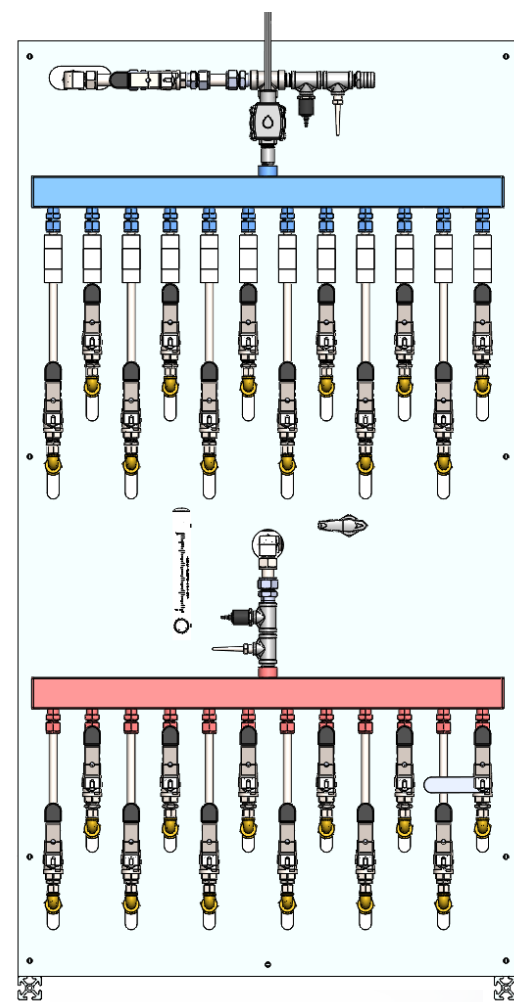
working with BNL and UNM colleagues

Carry-Boards	20 um LGADs (3070)	50 um LGADs (3045)	AC-LGADs
1	1217	1313	W1-22
2	1215	1307	W2-15
3	1808	1514	W2-17
4	1807	1915	W2-22
5	1206	1908	W2-29
6	1216	1911	N/A
7	1913	1912	N/A
8	1212	1910	N/A



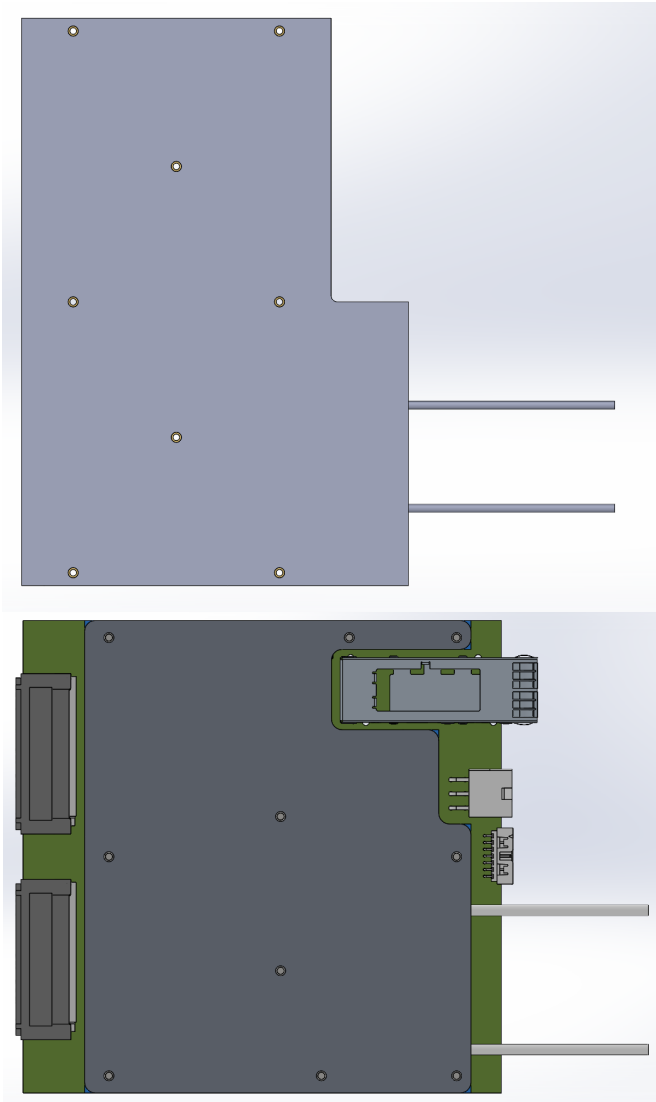
Eric's introduction

- Designed cooling plate to be mounted to FEE boards for TPOT micromega detector (bottom).
 - CAD, thermal analysis and pressure drop estimates.
- Designed and built water cooling system to service MVTX DAQ electronics cooling plates (right)
 - Stainless steel, brass, and plastic construction



Water cooling for electronics boards at LANL

- Approximately 40 cooling plates were built for the two systems by a Hand Precision in Los Alamos, NM
- Glue was applied to TPOT cooling plates at LANL
- MVTX electronics cooling system was built and tested at LANL
- Thermal padding was cut and mounted to electronics boards at LANL
- \$30k for 0.1 FTE Mechanical Engineer, M&S, travel



FY24 LANL plan

- Plan to characterize the irradiated AC-LGAD samples with the wired bounded 16-CH carrier boards.
- Would like to participate in future AC-LGAD beam tests at Fermi lab if schedule allows.
- If needed, will prepare and perform the irradiation tests at LANL LANSCE facility.
- Would like to contribute to the AC-LGAD ToF mechanical design and focus on the cooling system design (to be led by Eric).
- Details have been included in the eRD112FY24LANL.tex of the overleaf link.