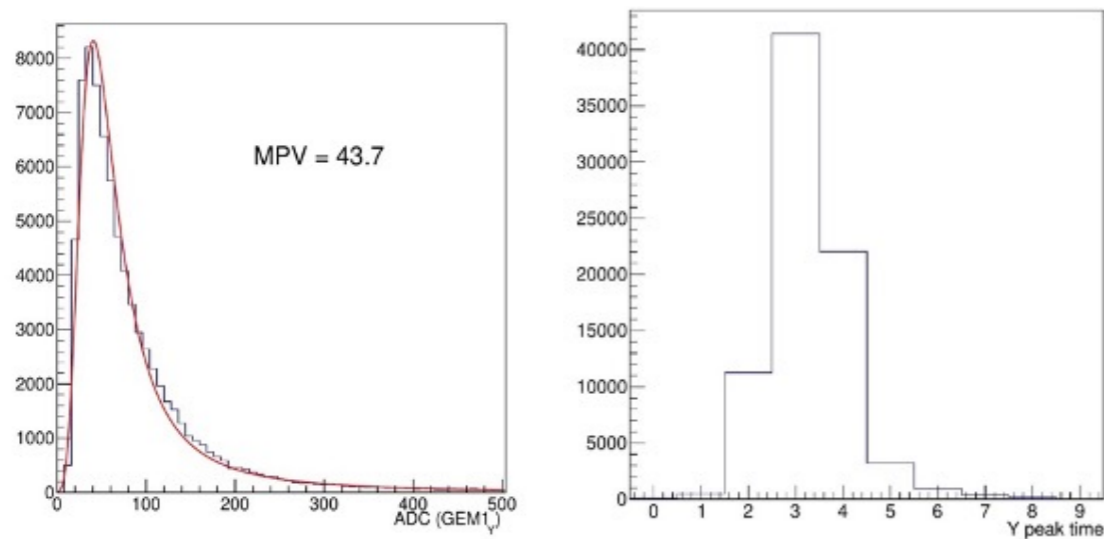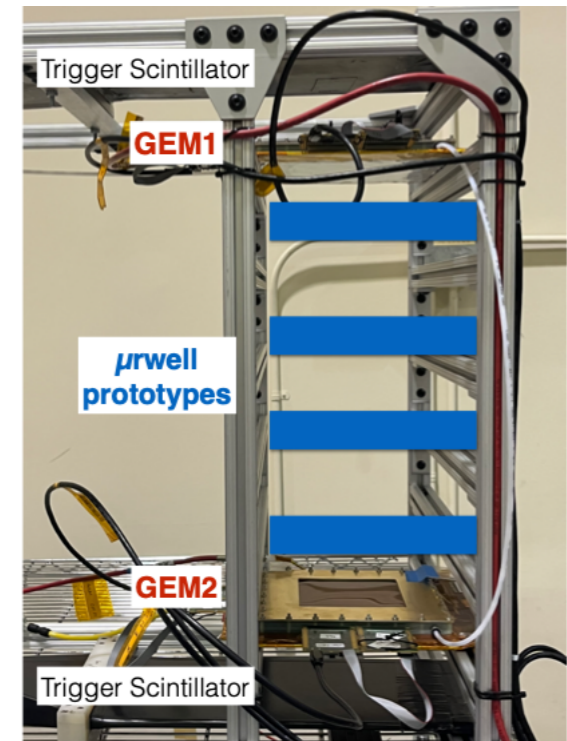# 2024-LDRD-11:
Third Quarter Update

Florian Hauenstein (PI)
Rafayel Paremuzyan (Co-PI)
Kondo Gnanvo (Contributor)
LDRD Meeting
07/16/24

Advisers: Stepan Stepanyan (JLab),
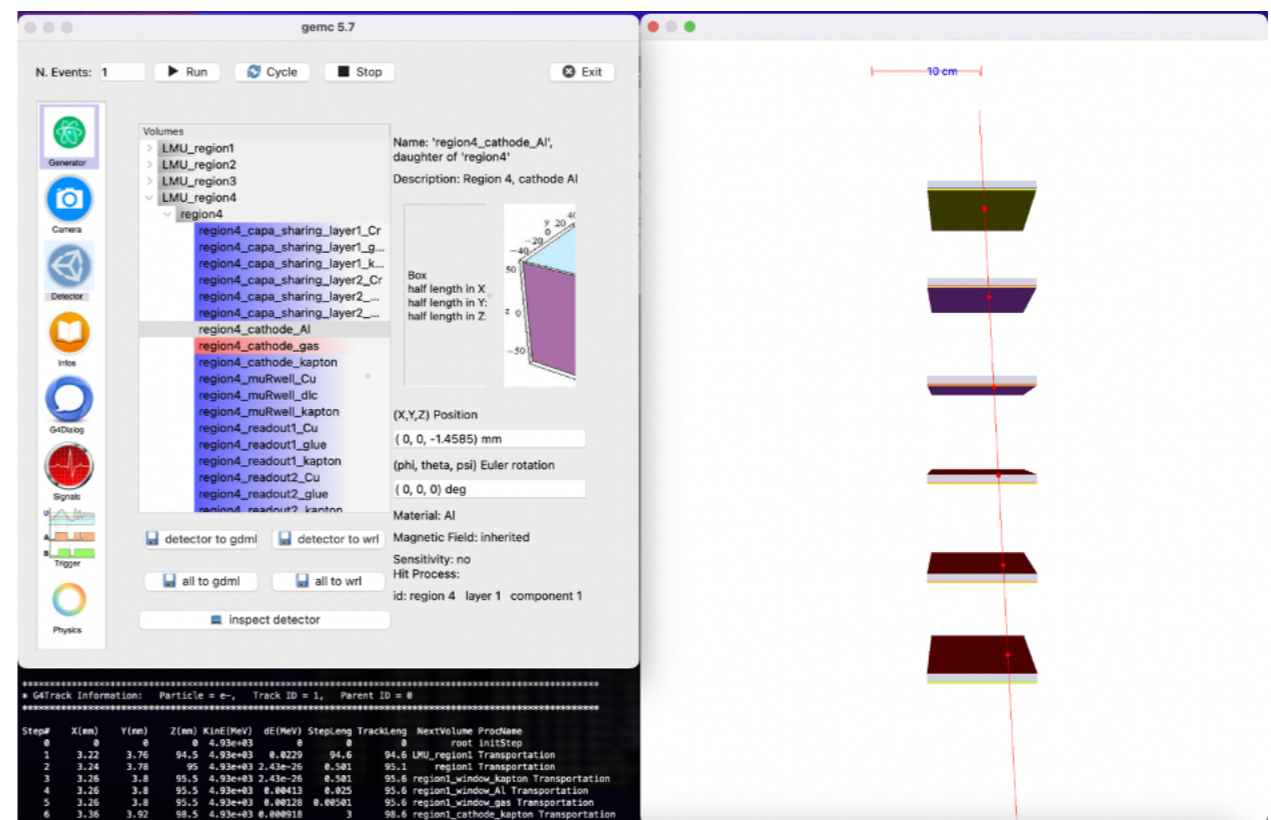Maurizio Ungaro (JLab),
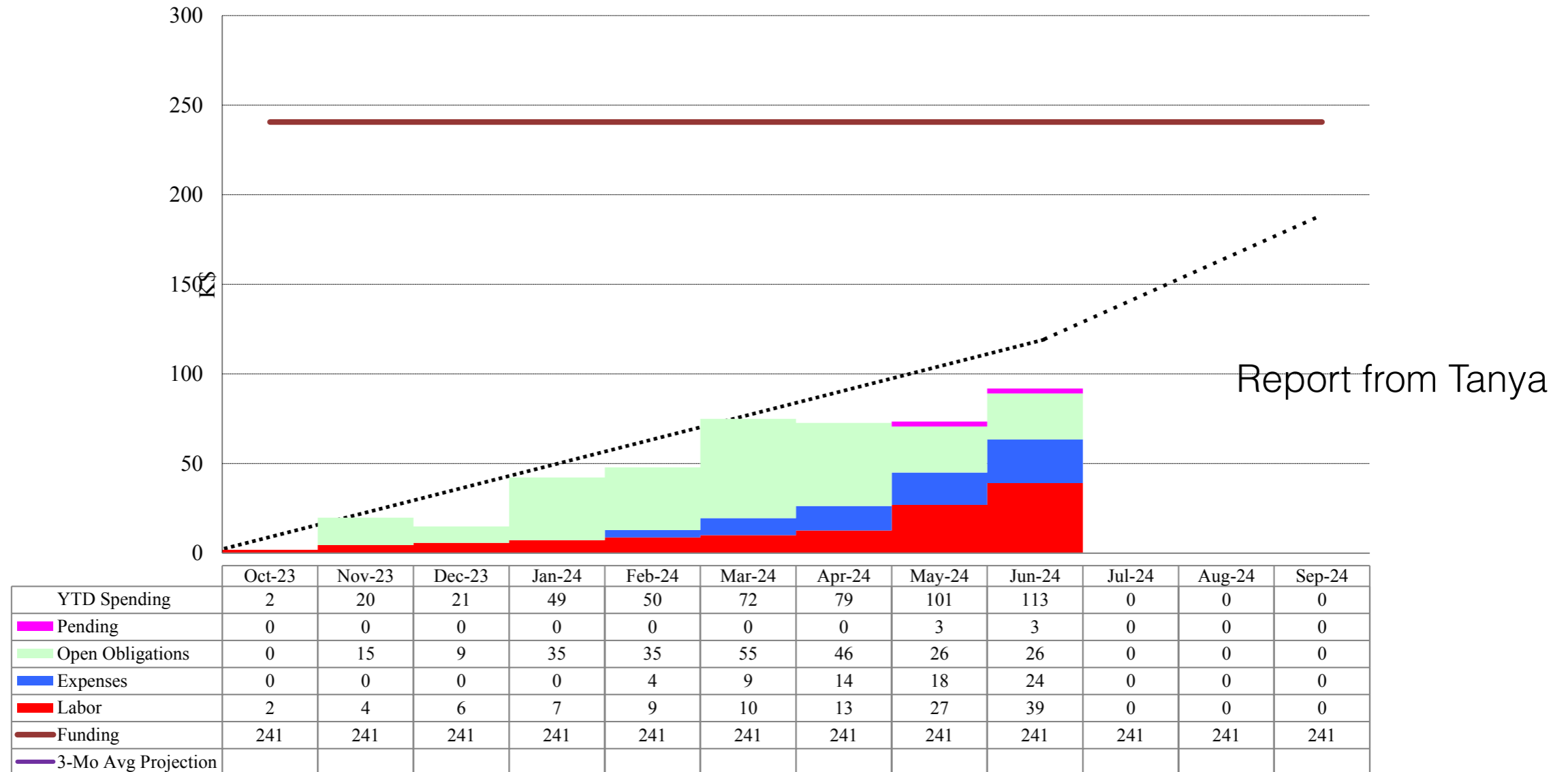Raffaella Devita (INFN)

Jefferson Lab

Objectives - Status

1. Four µRWELL prototypes for high-rate operation on delivery (~ 3.5 month delay)
2. Test setup assembled and ready to go for prototypes

   - VXS crate borrowed from other group (new crate should be here in July)
   - SRS crate borrowed from other group (there has been progress with CERN and we will try to buy one this month)

3. Initial test of GEM trackers with cosmics completed

4. Geometry implementation of cosmic setup in MC
5. Talk at QNP2024 (https://indico.icc.ub.edu/event/180/contributions/2797/

Budget Status - End of July

Report from Tanya

	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24
YTD Spending	2	20	21	49	50	72	79	101	113	0	0	0
Pending	0	0	0	0	0	0	0	3	3	0	0	0
Open Obligations	0	15	9	35	35	55	46	26	26	0	0	0
Expenses	0	0	0	0	4	9	14	18	24	0	0	0
Labor	2	4	6	7	9	10	13	27	39	0	0	0
Funding	241	241	241	241	241	241	241	241	241	241	241	241
3-Mo Avg Projection												

- Open Obligations
  - urwell: $24k
  - VXS crate: $20k
- Labor expenses not on track due to delayed start of postdoc, mismatch of ~$50k
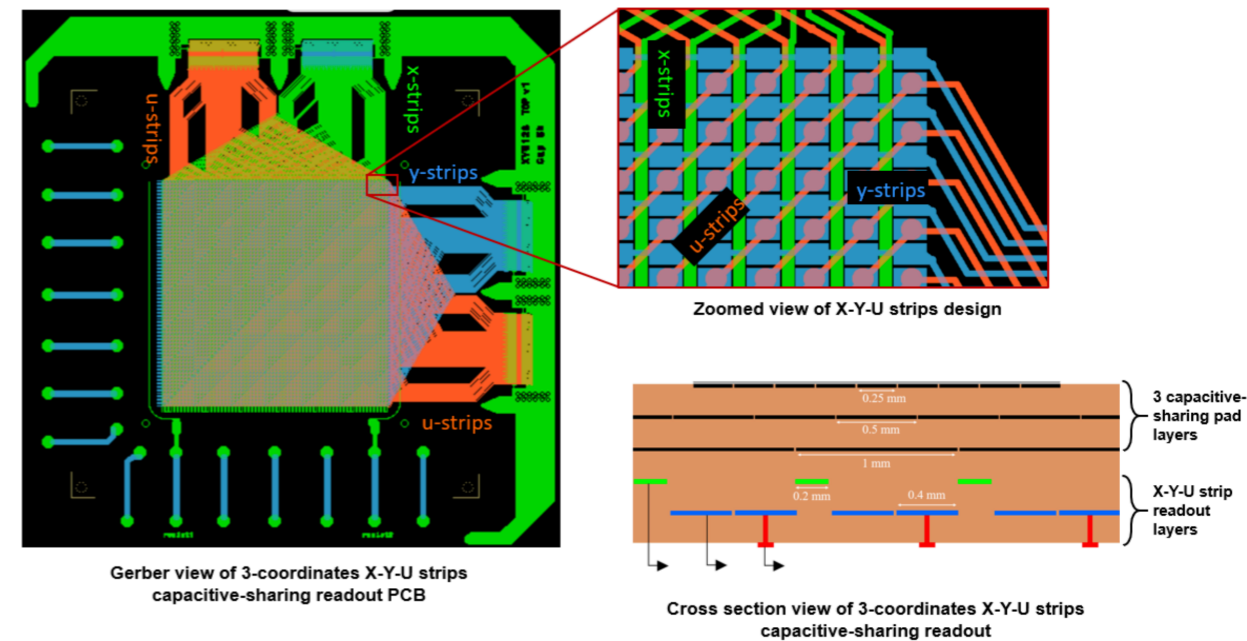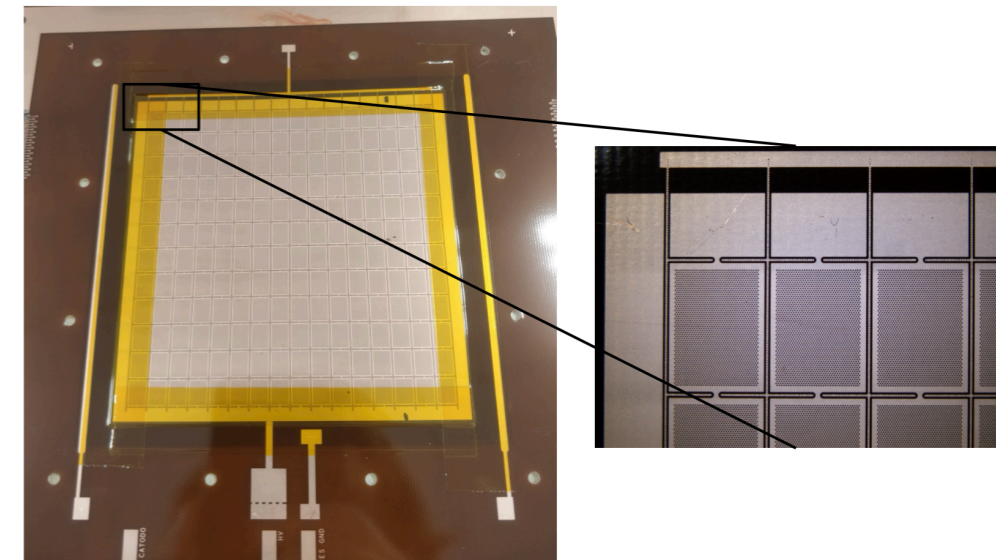- Expect increased work in the last quarter since prototype arrived —> detailed cosmic tests

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Backup Slides

High-rate µRWELL Designs for Prototypes

1. Segmented resistive layer and grounding lines
   - Allow for higher particle fluxes
   - Optimization between gain in rate and geometrical acceptance

2. Thinner gap size

3. 2D and 3D (XYU) readout
   - Capacitive-sharing structures
   - Reduction of hit ambiguities better in 3D

Zoomed view of X-Y-U strips design

Gerber view of 3-coordinates X-Y-U strips
capacitive-sharing readout PCB

Cross section view of 3-coordinates X-Y-U strips
capacitive-sharing readout

Several prototypes to study individual effects

prototype	DLC design	readout	gap width
A	1	2D	normal
B	2	2D	normal
C	1	XYU	normal
D	1	2D	thin

Roles and Responsibilities

Name	Role	FY Effort (% FTE)	Responsibilities
Florian Hauenstein	PI	15	Oversee project as PI and work on design and test of prototypes
Rafayel Paremuzyan	Co-PI	10	Development of simulation and reconstruction together with Postdoc, support prototype tests
Kondo Gnanvo	Contributor	5	Design of prototypes, support testing of prototypes
TBD	Postdoc	80	Development of software, test measurements of prototypes