



BULLKID-DM Analysis

Giorgio Del Castello on behalf of the collaboration
INFN - Roma 1

January 14, 2026



Analysis Meetings

December 2025

 17 Dec **Analysis Meeting 17/12/2025**

 03 Dec **Analysis Meeting 03/12/2025**

November 2025

 19 Nov **Analysis Meeting 19/11/2025**

 05 Nov **Analysis Meeting 05/11/2025**

Biweekly alternating the simulations meeting in the same timeslot (wednesdays from 4 pm)

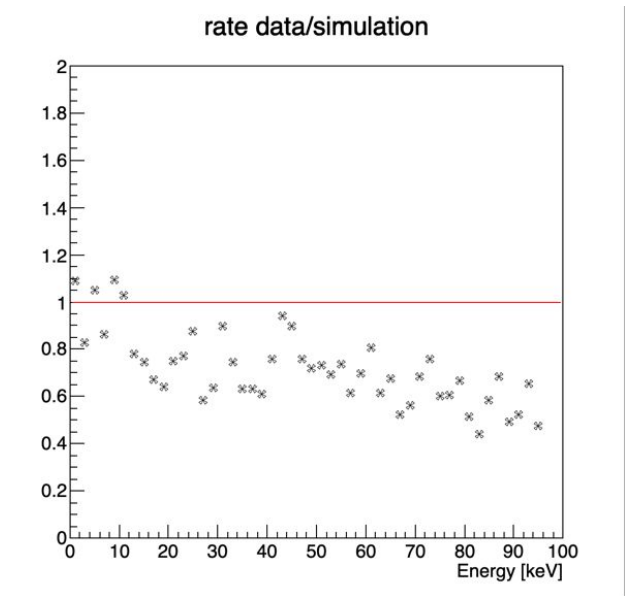
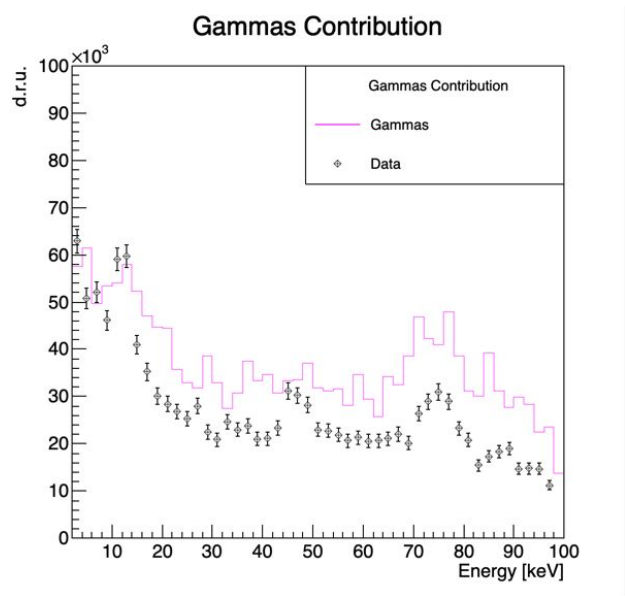
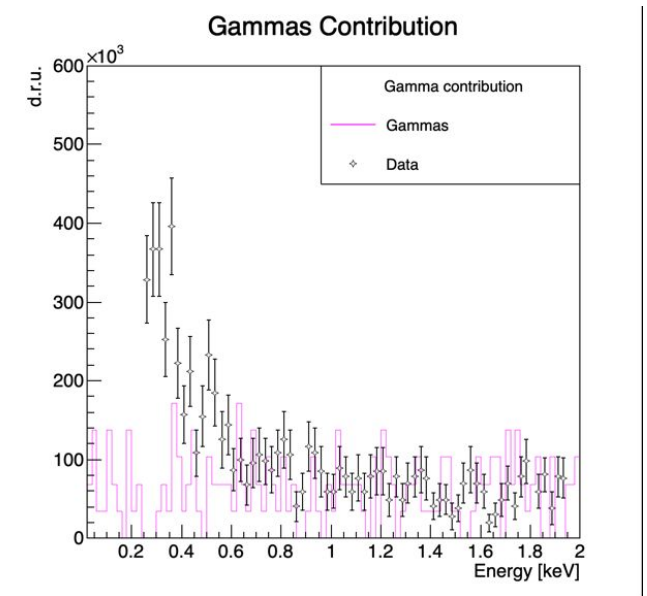


NEXT ANALYSIS MEETING : wednesday 21/01/2026

Joint Effort with Simulations

- Reduce Disagreement between data and Montecarlo
- Study of: Calibration, Efficiency, Amplitude Reconstruction
- Simulation analysis, Setup

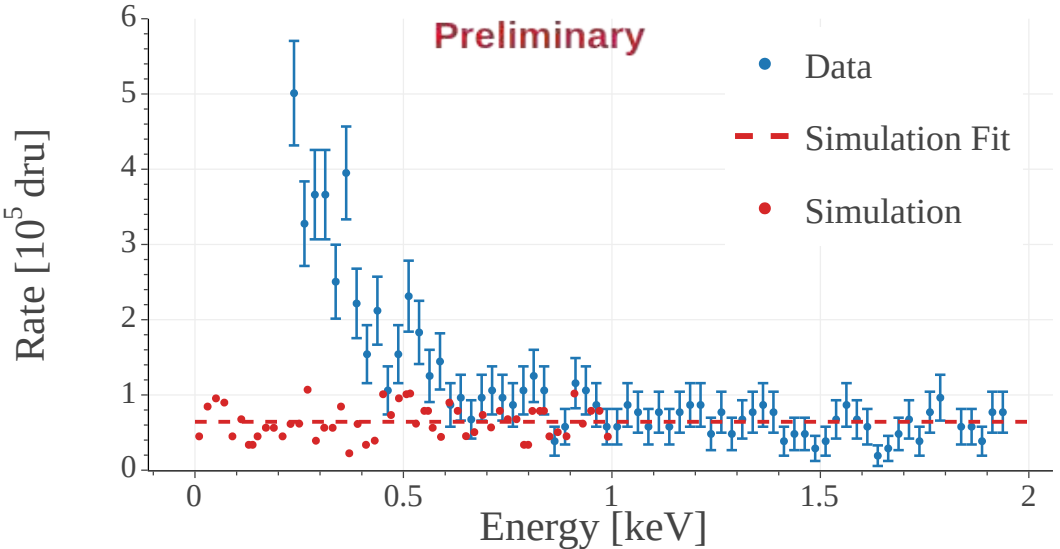
See talk from Alberto



Low Energy Excess Investigation

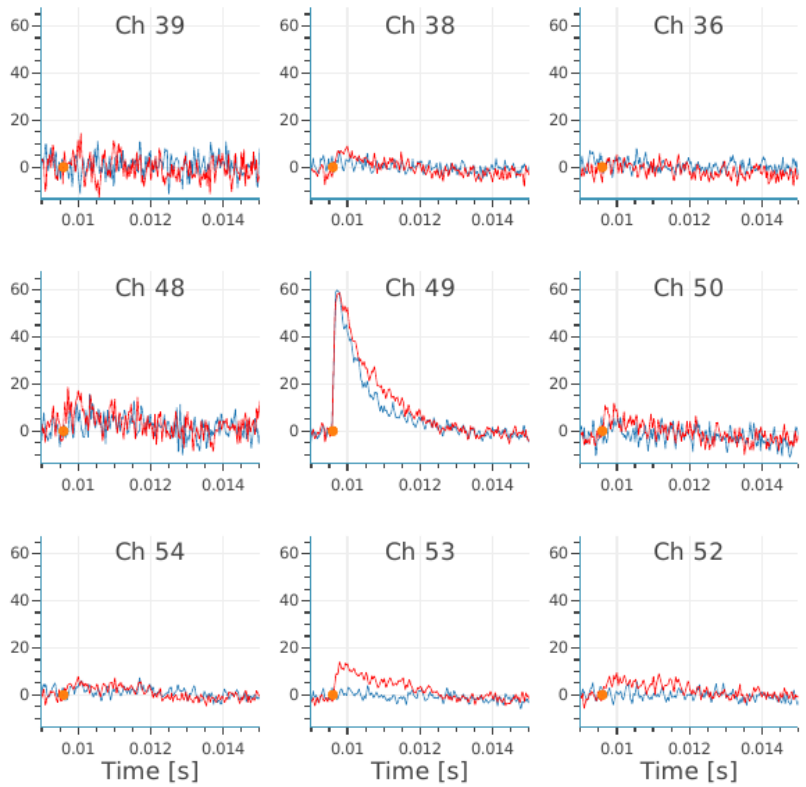
- Rise below 600 eV
- Smaller than other experiments
- No decay with time
- Non physical pulses - “Singles”

See talk from KangKang



LED

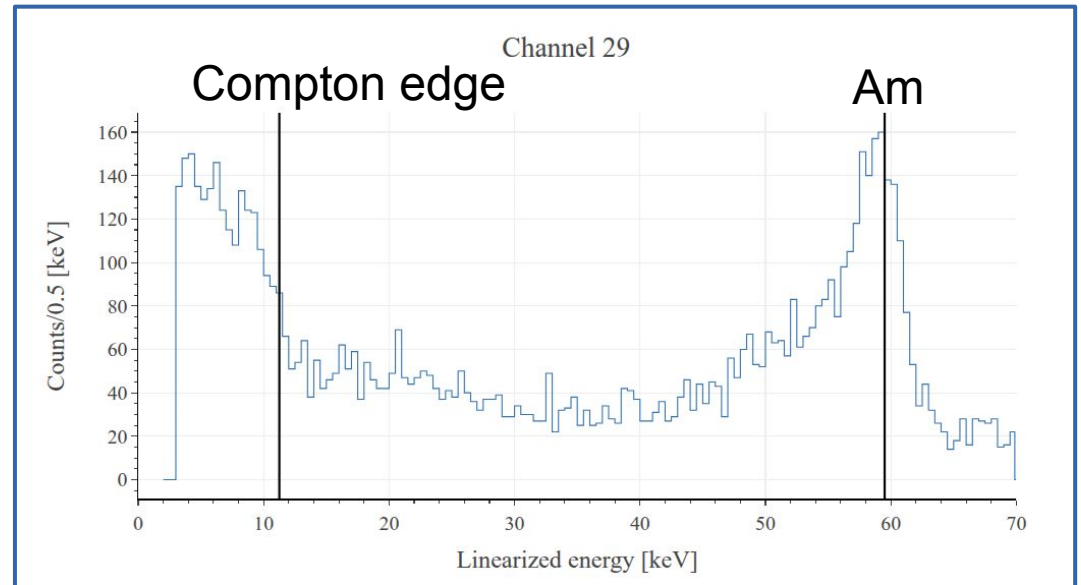
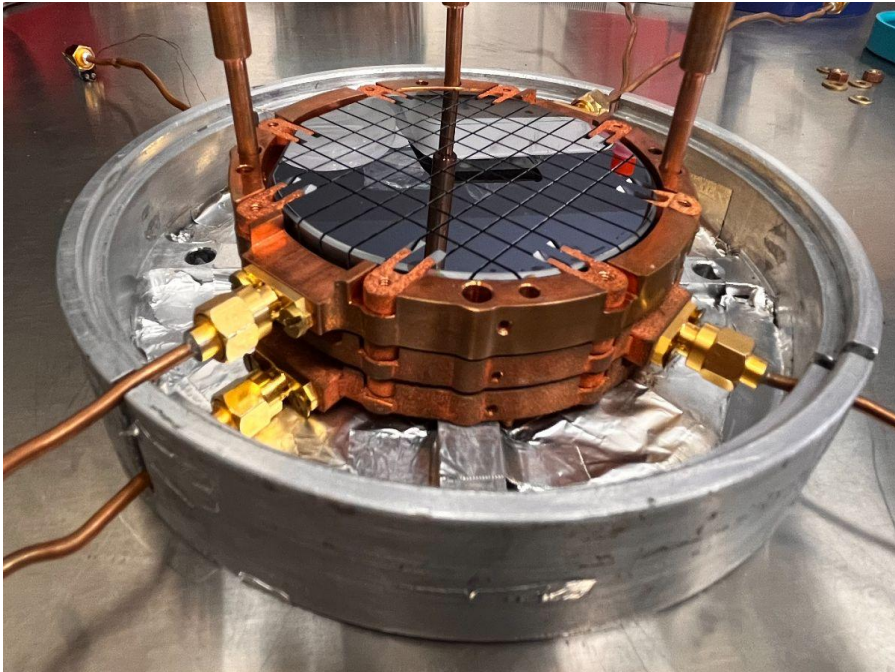
BACKGROUND



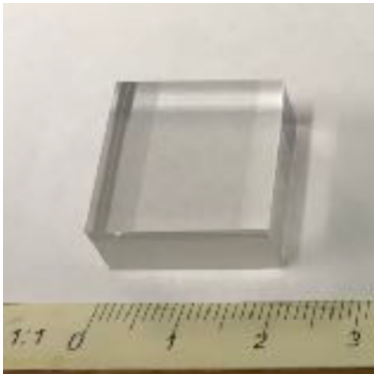
Calibration of Demonstrator Array with Americium

- Calibrate all 3 arrays with Am source
- Full Characterization using spectral features
- Viable solution for demonstrator run

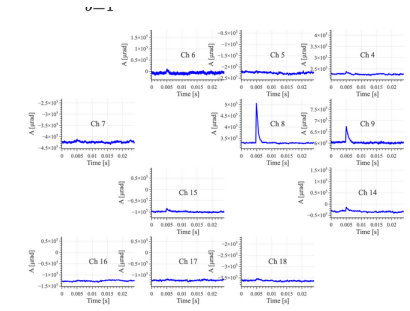
See talk from
Folcarelli



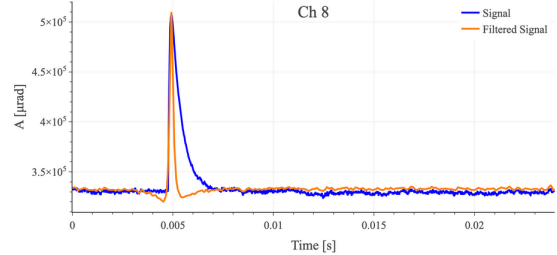
Other Efforts



Veto Characterization
See Tommaso's talk

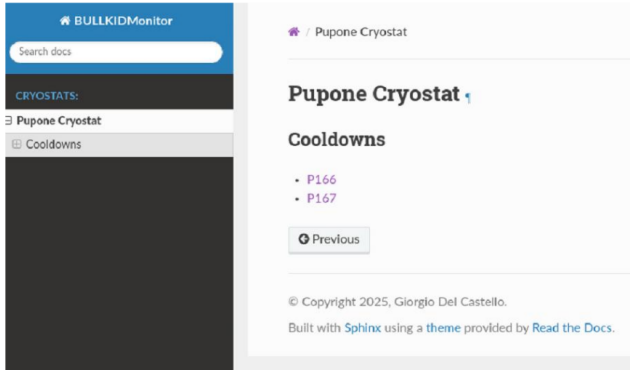


Filter



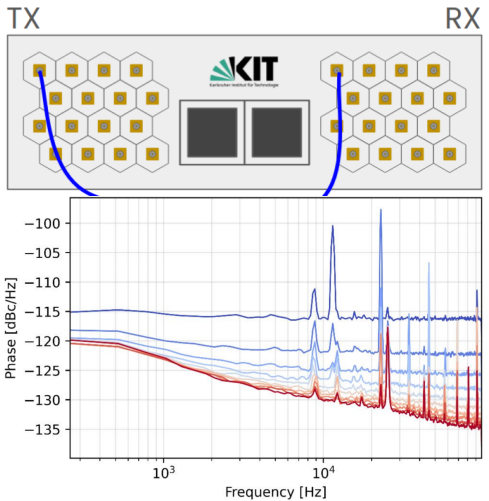
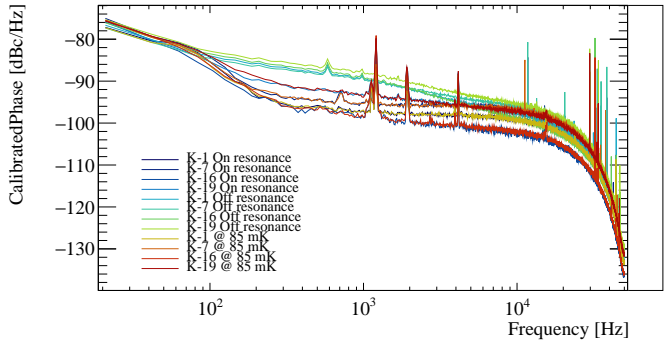
Accounts for signals in neighbours pixels

Multidimensional Analysis: OFND
See Tommaso's talk



Online Data Monitoring

Noise Setup Evaluations
See Camilla's Talk



Electronics Characterization
See Davide's Talk

Organization and Tasks

Computing

CNAF is the main data processing and computing technology research center of INFN

Exploiting innovative digital technologies for applications of many scientific disciplines

Resource	2026	2027
CPU	100 CPU x 9 Months	100 CPU x 9 Months
DISK	100 TB	100 TB
TAPE	60 TB	100 TB



Software Migration (analysis and simulation)
Account creation

- Giorgio
- Daniele
- Tommaso
- Matteo C.
- Matteo F.
- Davide
- Leonardo
- Kangkang
- Camilla

TO JOIN ANALYSIS EFFORTS

- Required **INFN account** (sufficient to start working)
- CNAF account after migration

LIST OF ALL NEW PEOPLE JOINING!

Tasks and Timeline

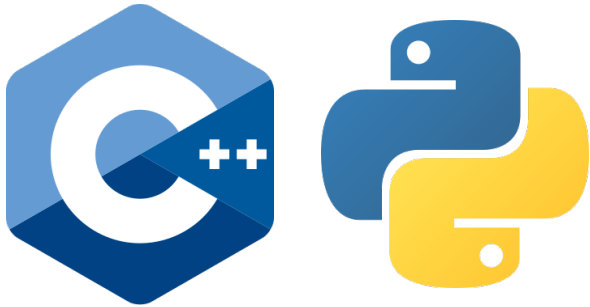
Task	Analyst	Timeline	Priority
Migration to CNAF	Giorgio	02/2026	4
OF Trigger on KIT electronics	Davide and ?	03/2026	5
File size optimization	Davide	03/2026	4
Kilo-pixel Analysis Development	Camilla and ?	>=12/2026	1
Data Visualization and software frontend		>=12/2026	1
OFND development and application	Matteo C. and Camilla	03/2026	
Online Monitoring	Leonardo and ?	03/2026	4
LED Calibration	Gabriele (master student)	02/2026	2
Low Energy Excess	Giorgio and Kangkang	02/2026	3
Veto Characterization	Tommaso	06/2026	3



BULLKID-DM

Thank you and enjoy the session

If you know:



Or are willing to learn...

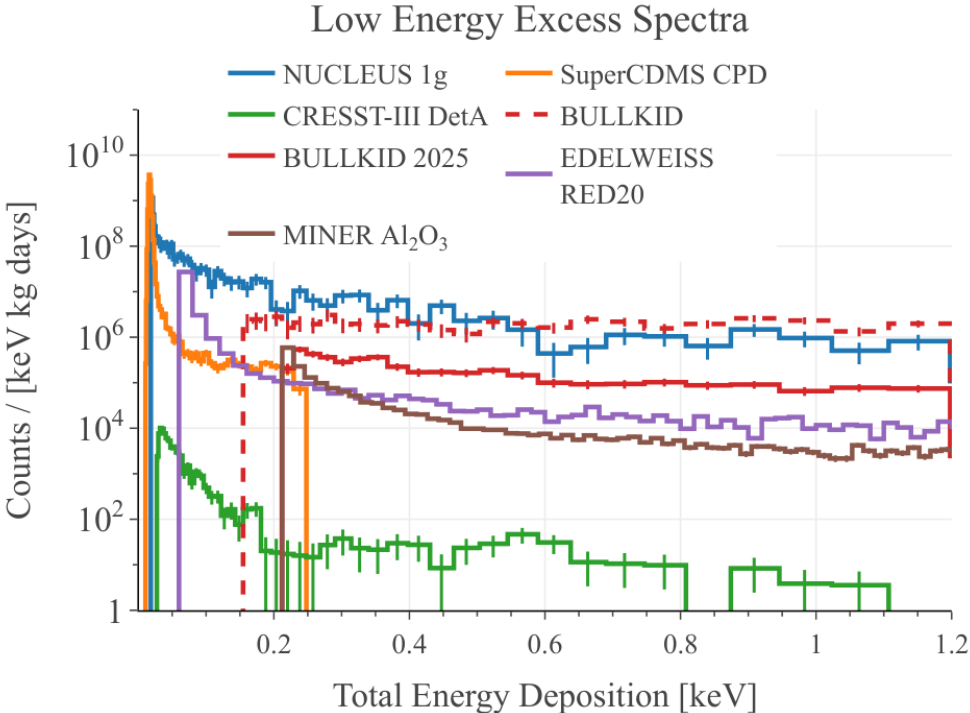


Backup Slides

Low Energy Excess



- Unexplained exponential rise of events at low energies
- Most low energy experiments are TES based
- **BULLKID: KID based experiment shows no evidence of LEE so far**



KIDs resilience is currently unexplained, the hypotheses are:

- KIDs are **simpler sensors** (evaporated lithography)
- KIDs are purely **athermal phonon** detectors
- Detector geometry

LOWER BACKGROUND IS NECESSARY FOR COMPETITIVE STATEMENT