

Advances in Space AstroParticle Physics

Jun 19 – 23 2023, Perugia



The fiber tracker of the Ziré instrument on board NUSES

R. Pillera* and M. N. Mazziotta,
on behalf of the NUSES Collaboration

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POSTER TRAILER



Istituto Nazionale di Fisica Nucleare



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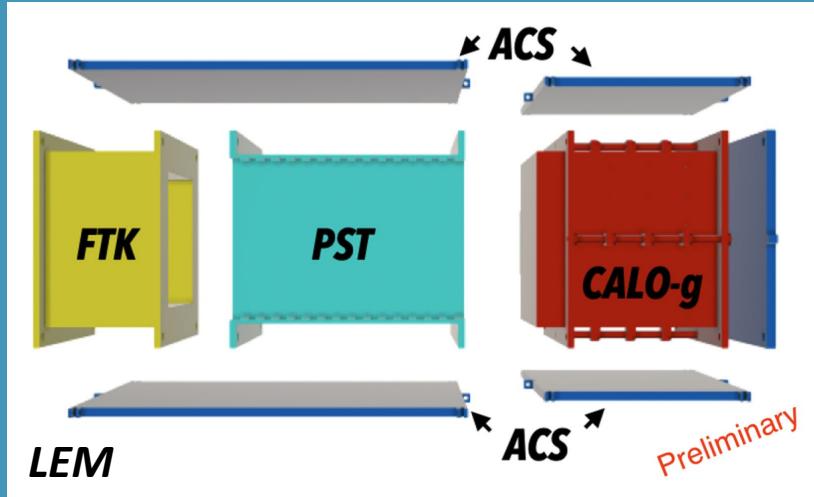
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ZIRÈ ON BOARD NUSES

- NUSES: a **pathfinder** for technologies future space-based detectors
- Full **SiPM** technology
 - **Low energy CR and gamma rays** for many scientific goals

Schematic layout of Ziré



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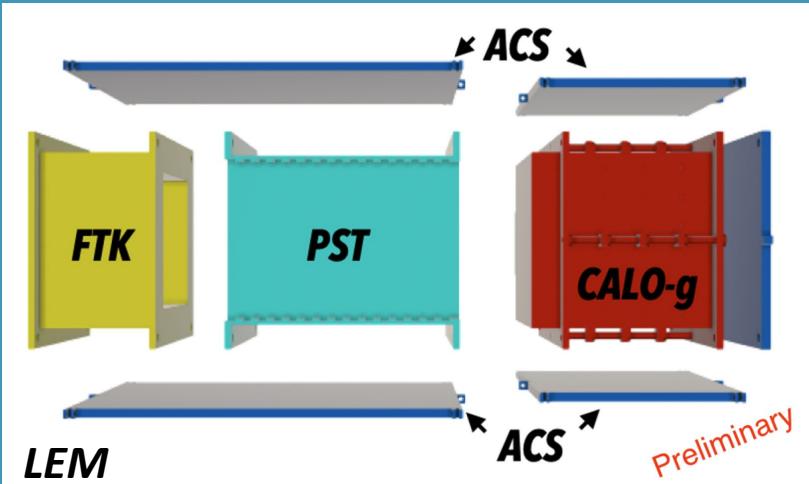
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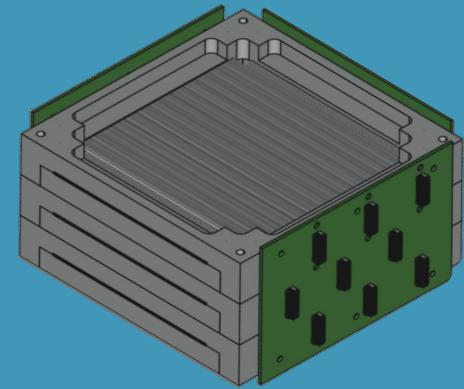
THE ZIRÈ FIBER TRACKER (FTK)

FTK tasks:

- provide a fast and efficient **trigger**
- measure the particle **entry point**
- measure the deposited **charge**

Scintillator fibers & SiPM arrays

Design:



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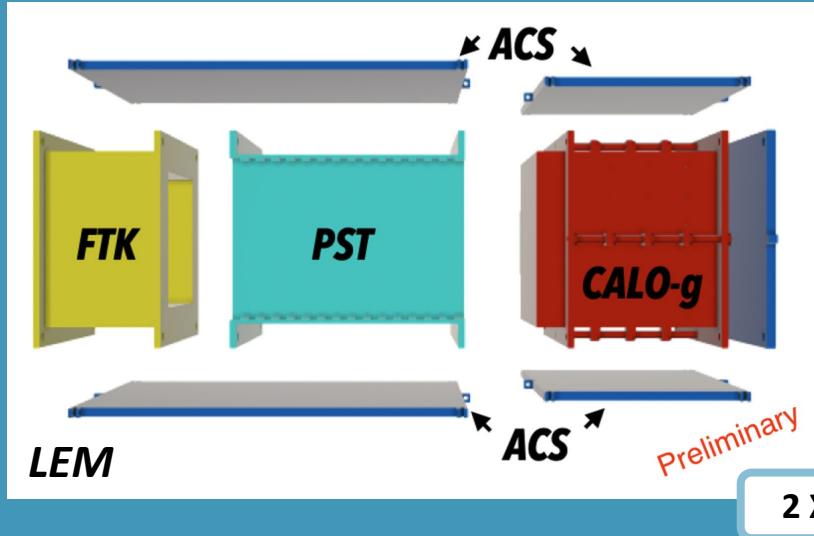
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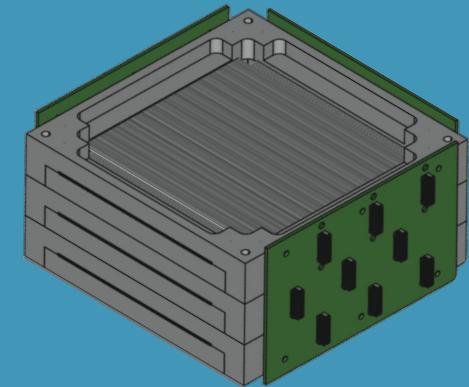
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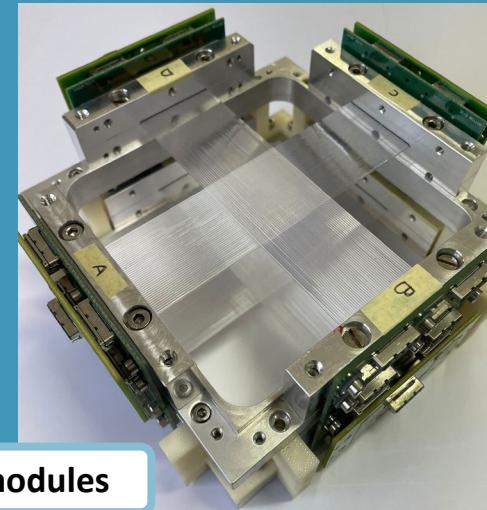
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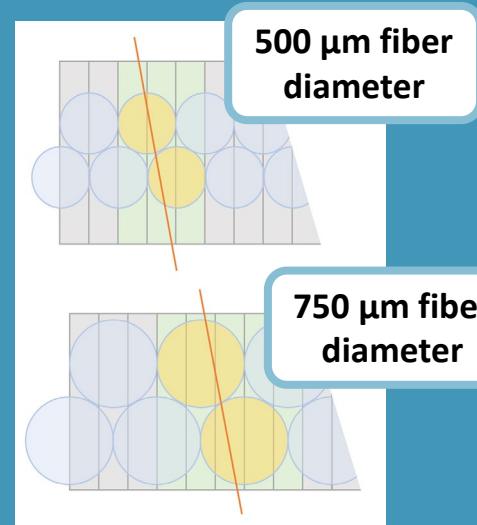
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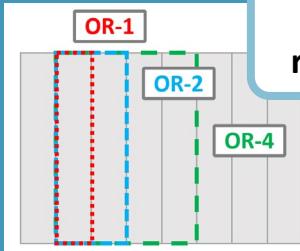
THE FTK PROTOTYPES



2 X-Y modules

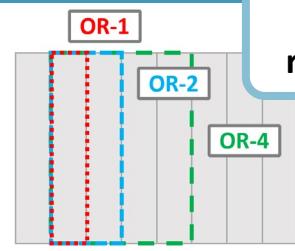


500 μm fiber diameter



750 μm fiber diameter

Different SiPM readout pitches



- Readout with **custom front-end board** featuring PETIROC2A ASIC

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CHARACTERIZATION OF THE PROTOTYPES

- Measurements in the lab ^{90}Sr electron source
- Beam test @ CERN PS

>> More details in the poster! <<

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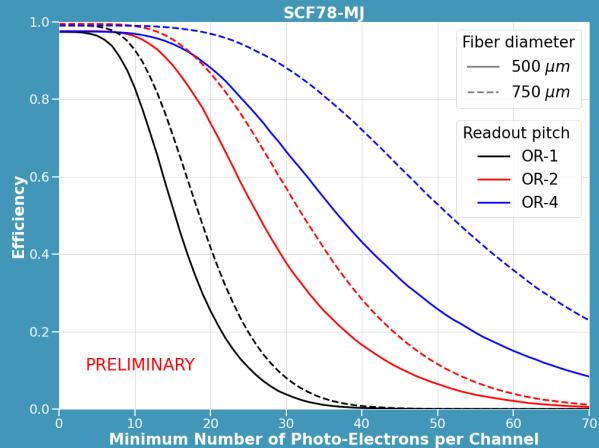
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Fiber-SiPM pitch geometries comparison



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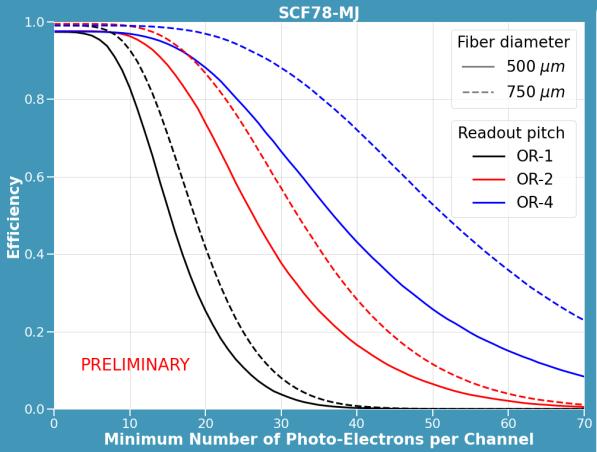
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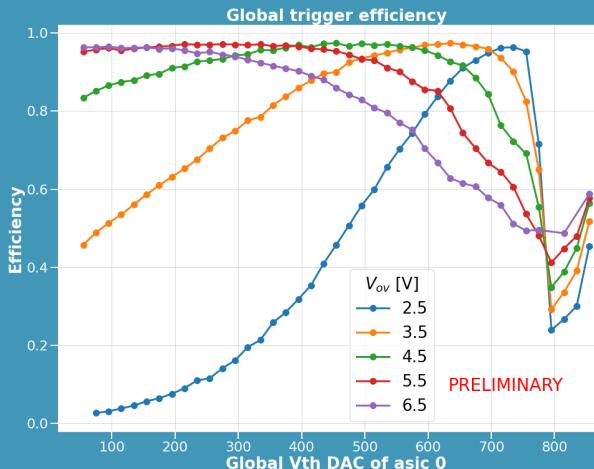
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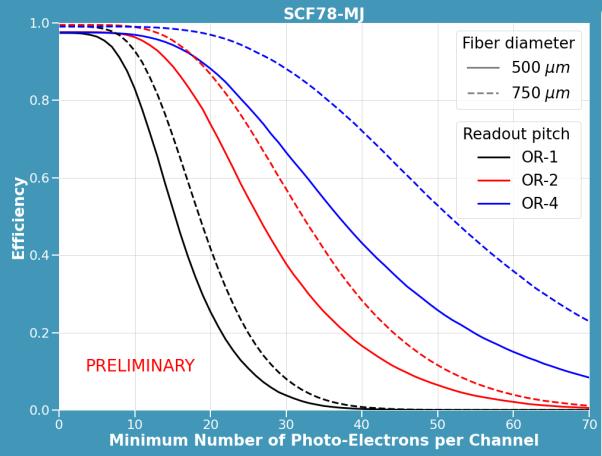
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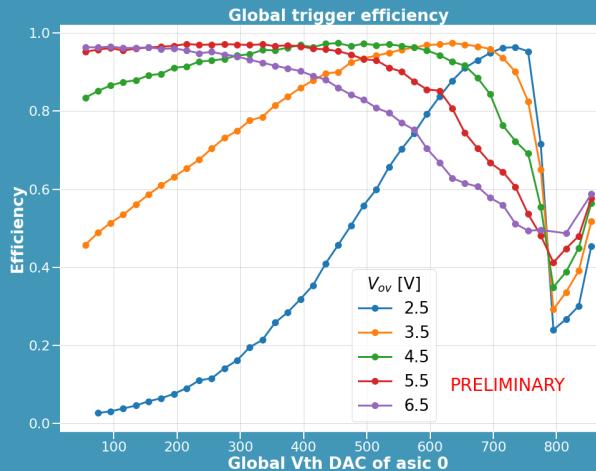
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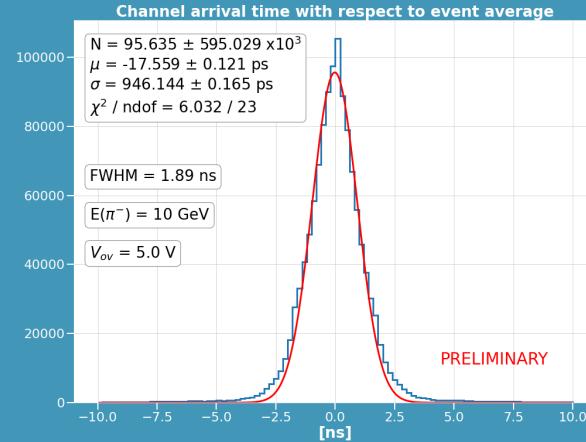
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Timing measurements for FTK-trigger feasibility



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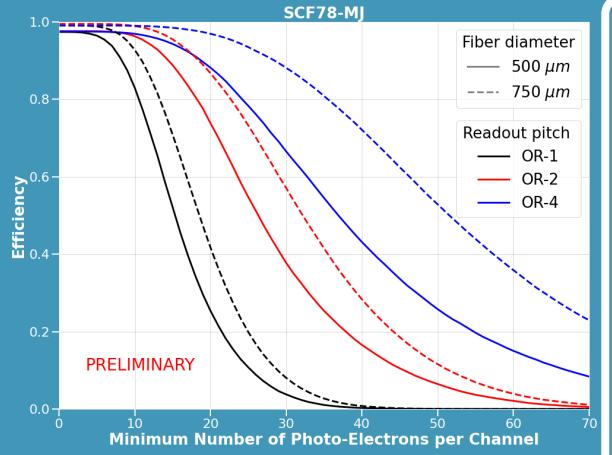
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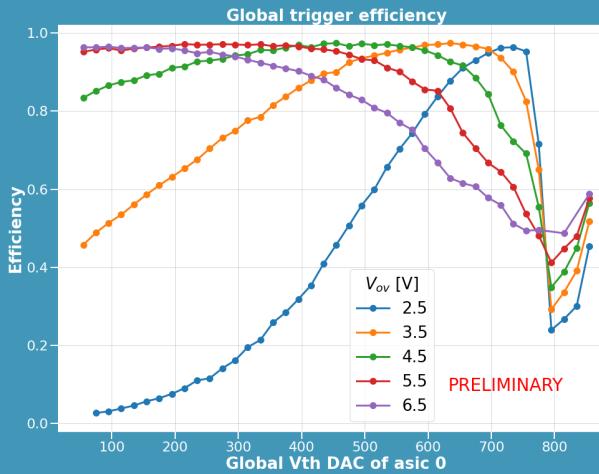
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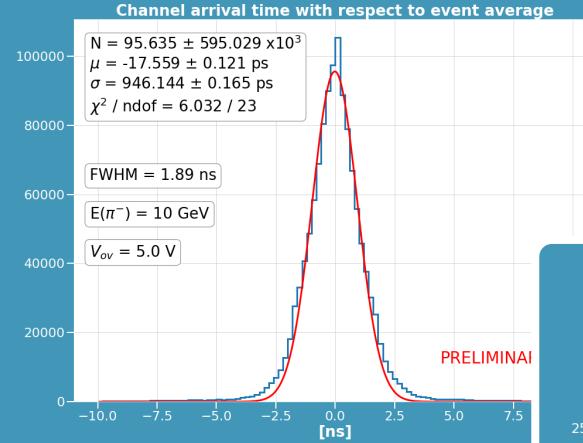
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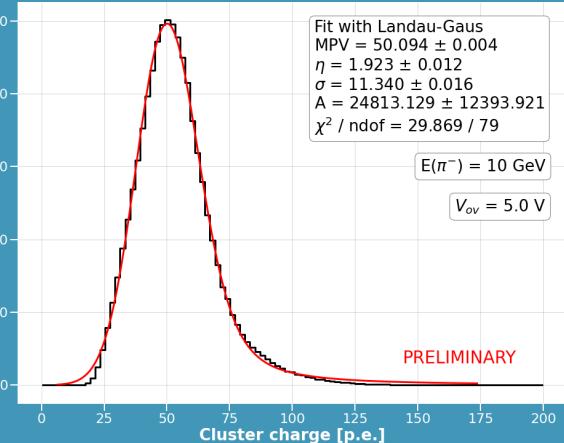
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Scintillator light yield measurements



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