

# WP6, Objectives and outcomes of WP6 in the second year of RADNEXT: Methodologies for Radiation Test of Systems

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RADNEXT 2<sup>nd</sup> Annual Meeting – 9-10 May 2023

<https://indico.cern.ch/e/radnext-2023>



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# Outline

- Structure and members
- Work Programme overview
- Second year achievements and ongoing activity
- Conclusions

# Structure and Members



**Luigi Dilillo**

(University of Montpellier)

WP leader



**Luis Entrena Arrontes**

(University Carlos III of Madrid)

Deputy WP leader

## Participants and associates

- Université de Montpellier (UM/IES)
- Katholieke Universiteit Leuven (KUL)
- Universidad Carlos III de Madrid (UC3M)
- European Organization for Nuclear Research (CERN)
- German Space Agency (DLR)
- Politecnico di Torino
- National Centre for Nuclear Research (NCBJ)



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# Structure and Members



- Katholieke Universiteit Leuven (KUL)
  - Recruitment of PhD student Levi MARIEN
  - Change destination of a part of financing support (1PM)



- European Organization for Nuclear Research (CERN)
  - Recruitment of PhD student Ivan SLIPUKHIN



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# Work Programme Overview

## Work package overview:

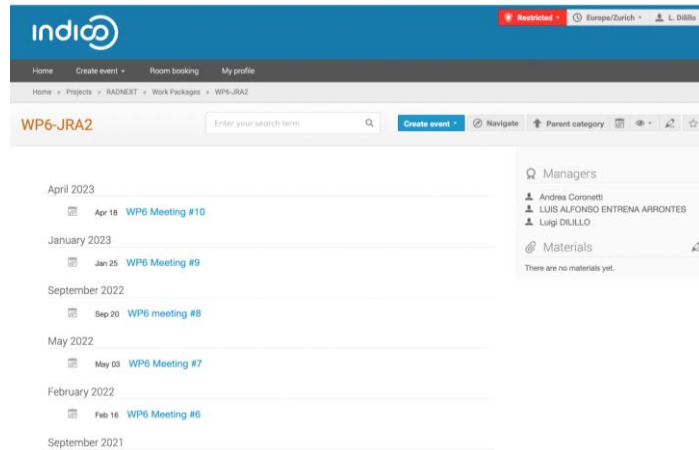
### *Standardization of system level radiation qualification methodology*

- Three operative tasks will focus on:
  - Setup preparation and stimuli definition
  - Pass/fail test
  - Test with enhanced observability
- The main goal will be the exploration of valid qualification procedures to be effective at system level. Its main added value is a reduced qualification cost and time, without significantly affecting the radiation hardness assurance level.

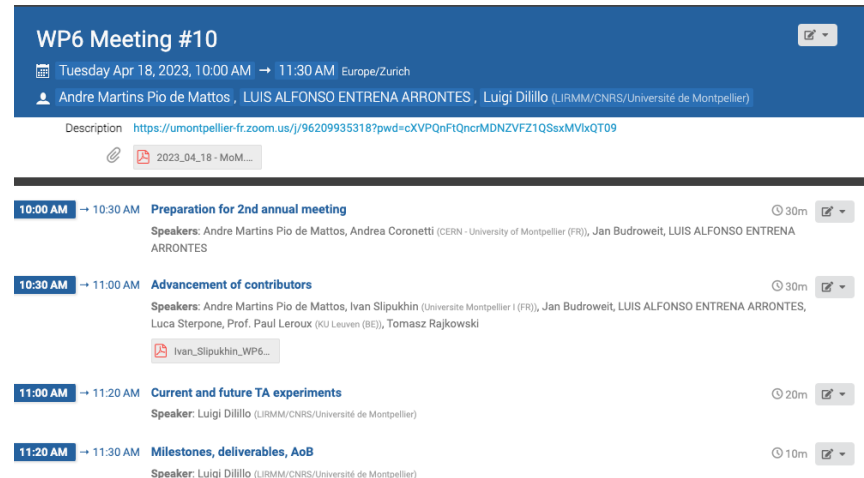


# Second year achievements and ongoing activity

- Regular meetings (10 in total) with all WP partners
  - Established connections/collaboration among partners
  - Introduction of new partner (NCBJ, Tomasz Rajkowski)
  - Activity status
  - Activity plans



The screenshot shows the Indico website interface. At the top, there is a navigation bar with the Indico logo and user information (Restricted, Europe/Zurich, L. Dilillo). Below this is a breadcrumb trail: Home > Create event > Room booking > My profile. The main content area displays a calendar for WP6-JRA2. The calendar shows a list of meetings from September 2021 to April 2023. The most recent meeting, 'WP6 Meeting #10', is highlighted in blue and is scheduled for Tuesday, April 18, 2023, from 10:00 AM to 11:30 AM in Europe/Zurich. A sidebar on the right shows 'Managers' (Andrea Coronetti, LUIS ALFONSO ENTRENA ARRONTES, Luigi DILILLO) and 'Materials' (There are no materials yet).



The screenshot shows the detailed event page for 'WP6 Meeting #10'. The event is scheduled for Tuesday, April 18, 2023, from 10:00 AM to 11:30 AM in Europe/Zurich. The organizers are Andre Martins Pio de Mattos, LUIS ALFONSO ENTRENA ARRONTES, and Luigi Dilillo (LIRMM/CNRS/Université de Montpellier). The description includes a Zoom link: <https://umontpellier-fr.zoom.us/j/96209935318?pwd=cXVPQnFtQncrMDNZVFZ1QScxMlVxQT09>. The event agenda is as follows:

- 10:00 AM → 10:30 AM Preparation for 2nd annual meeting** (30m)  
Speakers: Andre Martins Pio de Mattos, Andrea Coronetti (CERN - University of Montpellier (FR)), Jan Budroweit, LUIS ALFONSO ENTRENA ARRONTES
- 10:30 AM → 11:00 AM Advancement of contributors** (30m)  
Speakers: Andre Martins Pio de Mattos, Ivan Slipukhin (Université Montpellier I (FR)), Jan Budroweit, LUIS ALFONSO ENTRENA ARRONTES, Luca Sterpone, Prof. Paul Leroux (KU Leuven (BE)), Tomasz Rajkowski
- 11:00 AM → 11:20 AM Current and future TA experiments** (20m)  
Speaker: Luigi Dilillo (LIRMM/CNRS/Université de Montpellier)
- 11:20 AM → 11:30 AM Milestones, deliverables, AoB** (10m)  
Speaker: Luigi Dilillo (LIRMM/CNRS/Université de Montpellier)



# Second year achievements and ongoing activity

- **Application to RADNEXT TA for probing irradiation test campaigns (PSI, ChipIR, PARTREC, CHARM)**
  - With more than one partner: direct exchanges and collaborations
  - Checking and applying on the field methodologies and practices
- **Dissemination**
  - Several papers in international conferences (RADECS'23, ETS'22, DFTS'23, IWASI'23, REDW'22, REDW'23)
  - Several papers in international journals (Electronics, Journal of Instrumentation, TNS)
- **Collaboration with other WPs**
  - WP8 dissemination (ETS'22)
- **Student exchange**
  - UM/IES ↔ UC3M: Andre M. P. Mattos, Pablo M. A. Delgado



# Second year achievements and ongoing activity

- Experiments performed at **CHARM**, **Chiplr**, and **PSI**.
  - Development of test setups targeting enhanced observability
  - Systems mainly based on:
    - ▶ Xilinx Zynq-7000 SoC
    - ▶ Microchip M2S010 SoC
- Investigation of a SELs in a SRAM on-board PROBA-V satellite
- Characterization of a fault-tolerant RISC-V SoC hosted on flash- and SRAM- based FPGAs
- Characterization of GPUs
- Characterization of FPGA SoCs, in which hard-core and soft-core are used
- Characterization of a testing platform for targeting system-level testing at CHARM facility



# Ongoing activities

- Formalize the methodologies/experiences from test campaigns
- Participations to test campaigns in new types of facilities
  - TA submission for ESRF micro-beam (new type of facility)
  - Test campaign with Laser attack
- Elaboration of the next milestones
- Cross WPs activity



# Conclusions

- New member and new PhD recruitment
- Good partner interaction (UM/UC3M; UM/CERN)
- Good ongoing scientific activity and dissemination
- Starting milestone/deliverables elaboration

# Thanks for your attention!



*Image Source: IES/UM*