

# 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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RADNEXT 2nd Annual Meeting – 9-10 May 2023

# 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:

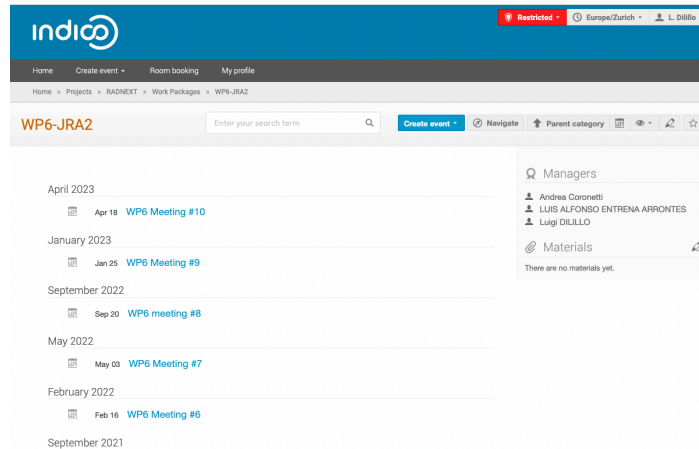
### *Standardization of system level radiation qualification methodology*

- 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

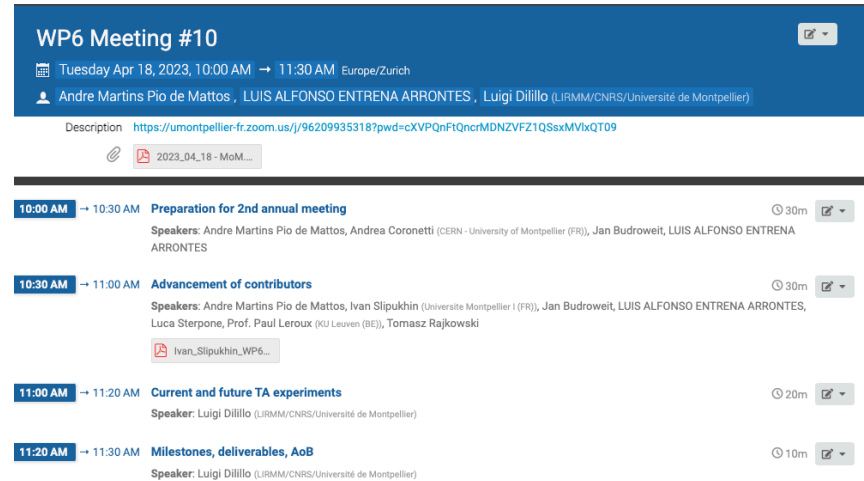
- Regular meetings (10 in total) with all WP partners
  - Established connections/collaboration among partners
  - Introduction of new partner (NCBJ, Tomasz Rajkowski)
  - Activity status
  - Activity plans



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 is titled 'WP6-JRA2' and includes a search bar and a 'Create event' button. A calendar view displays several meetings:

- April 2023: Apr 18 WP6 Meeting #10
- January 2023: Jan 25 WP6 Meeting #9
- September 2022: Sep 20 WP6 meeting #8
- May 2022: May 03 WP6 Meeting #7
- February 2022: Feb 16 WP6 Meeting #6
- September 2021

On the right side, there are sections for 'Managers' (listing Andrea Coronetti, LUIS ALFONSO ENTRENA ARRONTES, and Luigi DILILLO) and 'Materials' (with a note: 'There are no materials yet.').



The screenshot shows the details for 'WP6 Meeting #10'. The meeting is scheduled for Tuesday, Apr 18, 2023, from 10:00 AM to 11:30 AM in Europe/Zurich. The speakers 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=cXVPQnF1QncrMDNZVFZ1QSsxMVlxQT09>. Below the description, there is a list of agenda items:

- 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*