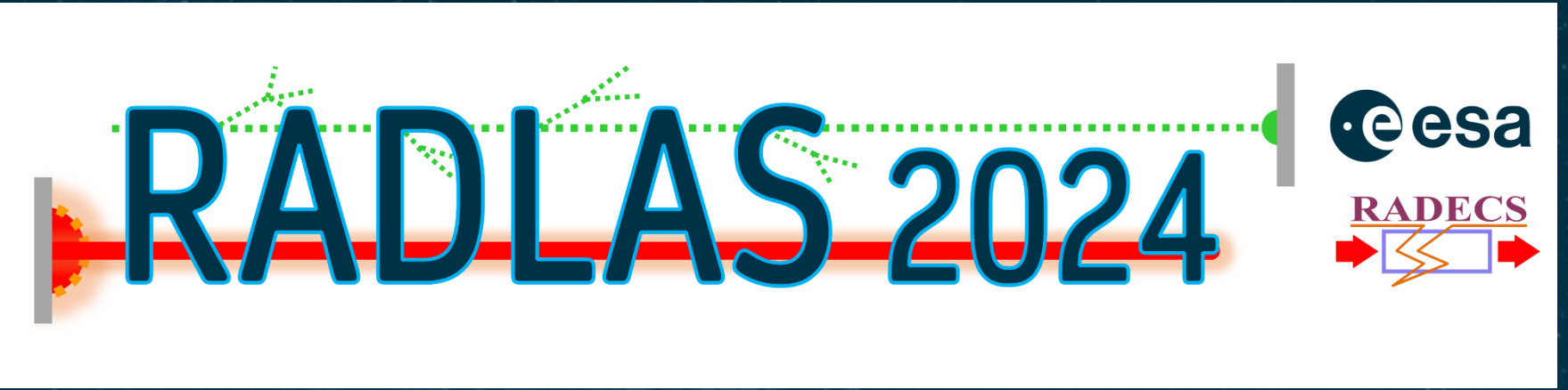
Welcome to



6th Workshop on Laser Testing of Radiation Effects on Components and Systems

Ali Zadeh - *Head of the Data Systems, Microelectronics and Component Technology Division*
Thomas Borel - *Component Test Engineer*

ESA ESTEC
11/09/2024

6th Workshop on Laser Testing of Radiation Effects on Components and Systems

ESA - **E**uropean **S**pace research and **TE**chnology **C**entre (ESTEC)

The only workshop mainly focussing on laser testing of EEE

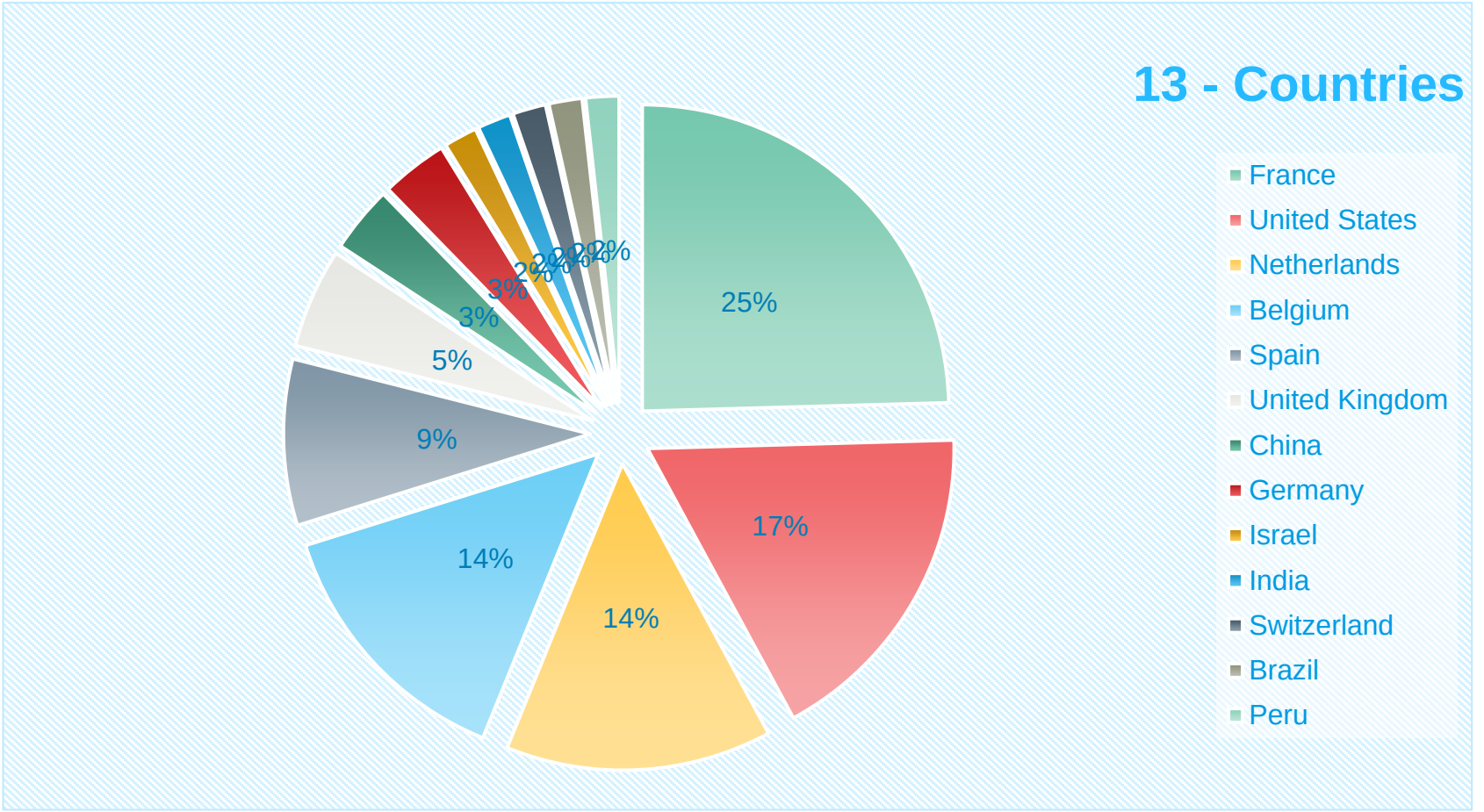
Previous Editions

- RALFDAY 2007
- RALFDAY 2009
- RADLAS 2011
- RADLAS 2013
- **RADLAS 2017 – Montpellier (7 years ago !)**

Technical Committee:

Christian Poivey, ESA
Dale McMorrow, NRL
Florent Miller, Nucletudes
Thomas Borel, ESA
Vincent Pouget, UM - CNRS

Participants



Laser in ESA (ESTEC)

Starting point

- Laser SEE test methods utilised for research as well as industrial purposes
- ESA has been following the Laser SEE test approaches closely for years
- In 2021 ESA acquired an SPA and TPA Laser test system

Why Laser SEE testing

- Alternative test method, that can generate charges in a similar way as HI
- Screening and Validation
- Cost Effective
- Alleviate Heavy ion Facility unavailability

Approach

- Predominantly R&D activities but also project support
  - TDE: Single-Event Effects Testing with a Laser Beam – Guidelines (available)
  - TDE: Radiation Testing of Several COTS Parts to be Used as Protection Devices
  - TDE: Investigation on intra-die variability and radiation-induced SEL in a COTS SRAM memory flying on Proba-V
  - OSIP: Adoption of SEE laser testing as part of the RHA process for COTS screening and validation

Correlation to Heavy Ions data not straight forward

Main Objectives

(1) Increase competency and knowledge of SEE Laser Test Systems

(2) Work towards more cost-effective Radiation Hardness Assurance processes

Perspective with Pulse Laser testing

Laser Testing Guidelines:

- **Europe**: Single-Event Effects Testing with a Laser Beam – Guidelines (2023)
- **US**: Pulsed-Laser Single-Event Effects Testing - A Practical Desk Reference (2023)

For now, pulse laser testing is promising system for:

a) Screening of COTS component (before mainly HI test campaign)
b) Lot to lot variability
c) Failure analysis - design verification / radiation hardening
d) Calibration of radiation monitors
e) Research

Laser SEE Testing is an important tool in our toolbox
More R&D Activities are being proposed and initiated

Workshop format

Invited Talk

- "*Basics and definitions for Laser Testing of Single-Event Effects*", **Vincent Pouget**

- "*Historical look at the Development of the Focused, Pulsed Laser for SEE Testing of Integrated Circuits*", **Stephen Buchner** (Remotely)

Sessions:

- Recent test results (5 presentations)
- Test Methodology for SEE Laser Testing (2 presentations)
- Comparison between Laser and Heavy Ions (6 presentations)

Posters during Coffee break **(3 Posters)**

Round Table

Visit of the Materials & Electrical Components Laboratory (For registered person only)

About RADLAS

Schedule Morning

09:00

Coffee
Newton 2, ESA-ESTEC 09:00 - 09:30

1 - RADLAS 2024 - Opening *Ali Zadeh*

27 - Invited Talk: Basics and definitions for Laser Testing of Single-Event Effects *Vincent POUGET*
Newton 2, ESA-ESTEC 09:40 - 10:10

10:00

2 - Session: Recent Laser test results
Newton 2, ESA-ESTEC 10:10 - 11:10

11:00

Coffee Break
Newton 2, ESA-ESTEC 11:10 - 11:40

7 - Poster
Newton 2, ESA-ESTEC 11:10 - 11:40

2 - Session: Recent Laser test results
Newton 2, ESA-ESTEC 11:40 - 12:20

12:00

3 - Session: Test Methodology for SEE Laser Testing
Newton 2, ESA-ESTEC 12:20 - 13:00

13:00

Lunch Break
Newton 2, ESA-ESTEC 13:00 - 14:20

14:00

Schedule Afternoon

RADLAS 2024 RADECS

esa

13:00 **Lunch Break**
Newton 2, ESA-ESTEC 13:00 - 14:20

14:00 **20 - Invited Talk: Historical look at the Development of the Focused, Pulsed Laser for SEE Testing of Integrated Circuits** *Steve Buchner*
Newton 2, ESA-ESTEC 14:20 - 15:00

15:00 **4 - Session: Comparison between Laser and Heavy Ions**
Newton 2, ESA-ESTEC 15:00 - 16:00

16:00 **Coffee Break**
Newton 2, ESA-ESTEC 16:00 - 16:30

7 - Poster
Newton 2, ESA-ESTEC 16:00 - 16:30

4 - Session: Comparison between Laser and Heavy Ions
Newton 2, ESA-ESTEC 16:30 - 17:30

17:00 **5 - Round Table**
Newton 2, ESA-ESTEC 17:30 - 18:30

18:00

Posters

Three Posters

- "Nonlinear Multiphoton Absorption Of Silicon Carbide And Gallium Nitride Photodiodes In Near-Infrared Spectrum"
    - Presenter: Chris CHONG (Radtest Ltd)

- "Towards Laser Testing of FinFET Devices: Lessons Learnt from Planar Technologies"
    - Presenter: Maxim GORBUNOV (IMEC)

- "Towards a Laser to Beam SEE/SEL Estimation Methodology "
    - Presenter: Ricardo ASCAZUBI (Intel Corp.)

Wi-Fi Access

Wi-Fi

In Your badge

«Name» «Surname»

RADLAS 2024

Welcome to the RADLAS 2024

To access the ESA Wireless network please connect to the network with the following settings:

SSID: esa-public
Authentication: Open

Then open a web browser. You will be automatically re-directed to the appropriate login page, where you can enter the credentials.
Please note that the SSID name is case-sensitive (lower case).

«User»
«Psw»

Note: Please note that the SSID name, user, password are case-sensitive (all lower case)

ESTEC Site

- Coffee Corner
  - 07:30 – 17:00
- Restaurant
  - 11:30 – 14:00
- ESTEC Shop
  - 10:00 – 16:00
- Space EXPO
  - 10:00 – 17:00
- ESCAPE
  - 17:00 – 22:00

ESTEC Shop

Restaurant

Coffee Corner

Newton 2

ESCAPE

Space EXPO