

Towards a true 8-digit digitiser

EU Project overview and progress

HIGH PERFORMANCE DIGITIZER AND DC METROLOGY MEETING
19 FEBRUARY 2024, FEI STU, BRATISLAVA

Dr. Rado Lapuh

Left Right s.p.



**METROLOGY
PARTNERSHIP**



PROJECT IN NUMBERS

- Research Potential Call, \approx 900 k€
- Start - end: 1. June 2023 to 31. May 2026
- Coordinators: Oliver Power (overall)
Rado Lapuh (technical)

MOTIVATION

- Development of a digitiser
 - based on state of the art ADCs,
 - operating from DC to 100 kHz,
 - meeting demands for linearity, noise and overall accuracy of high level measurement applications that cannot be met using current available digitisers.

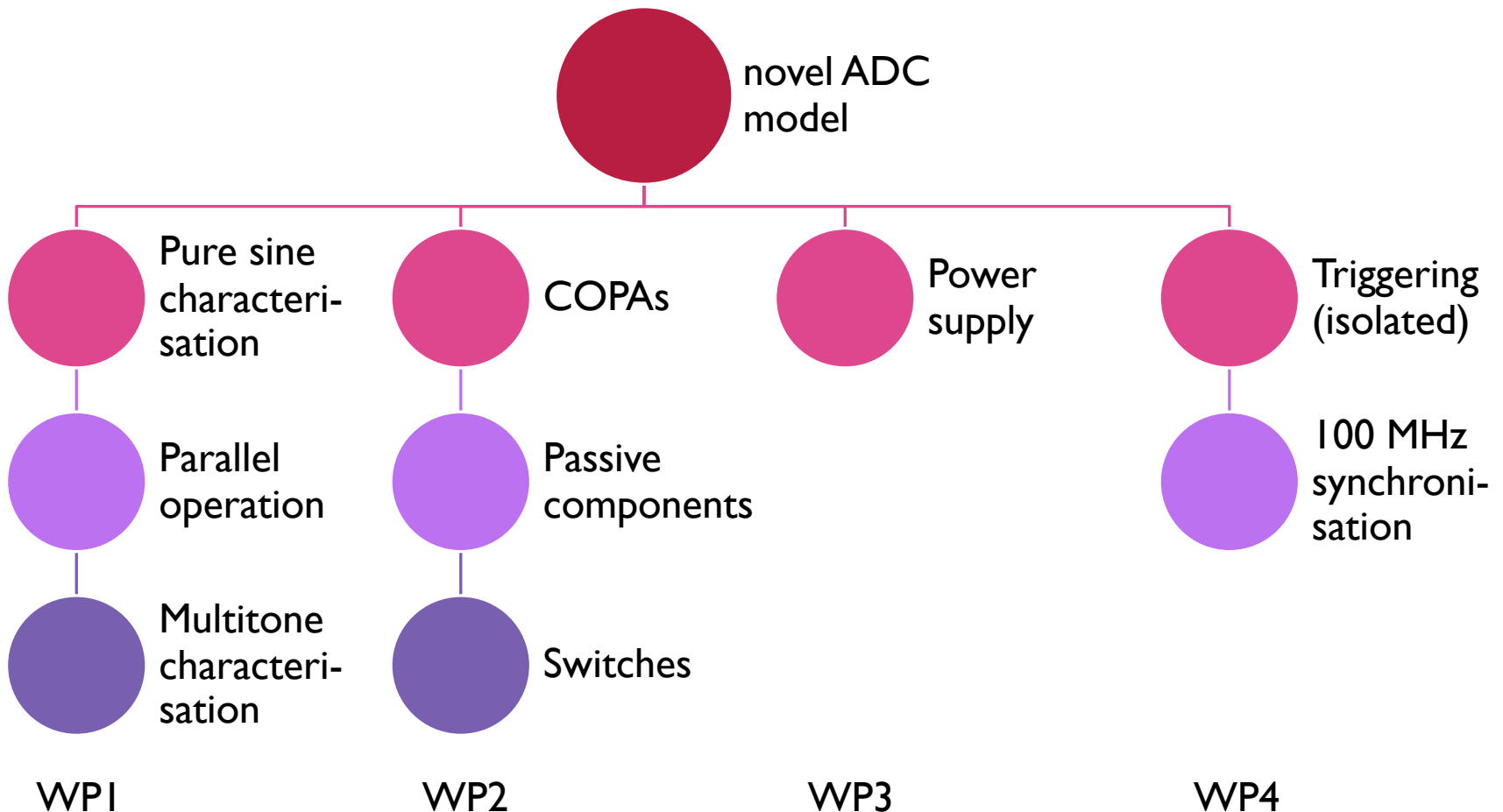
MOTIVATION

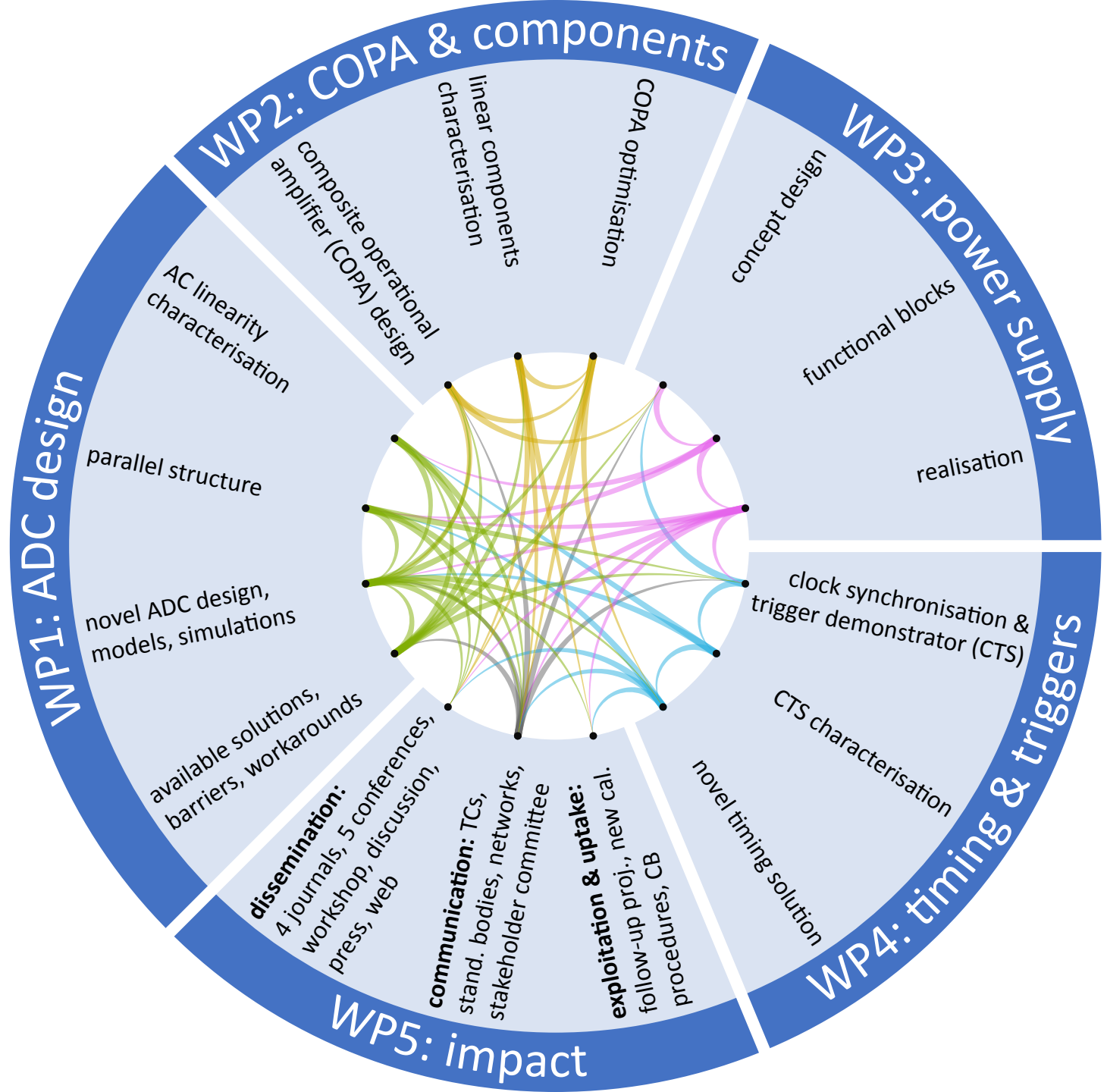
- Two stage approach:

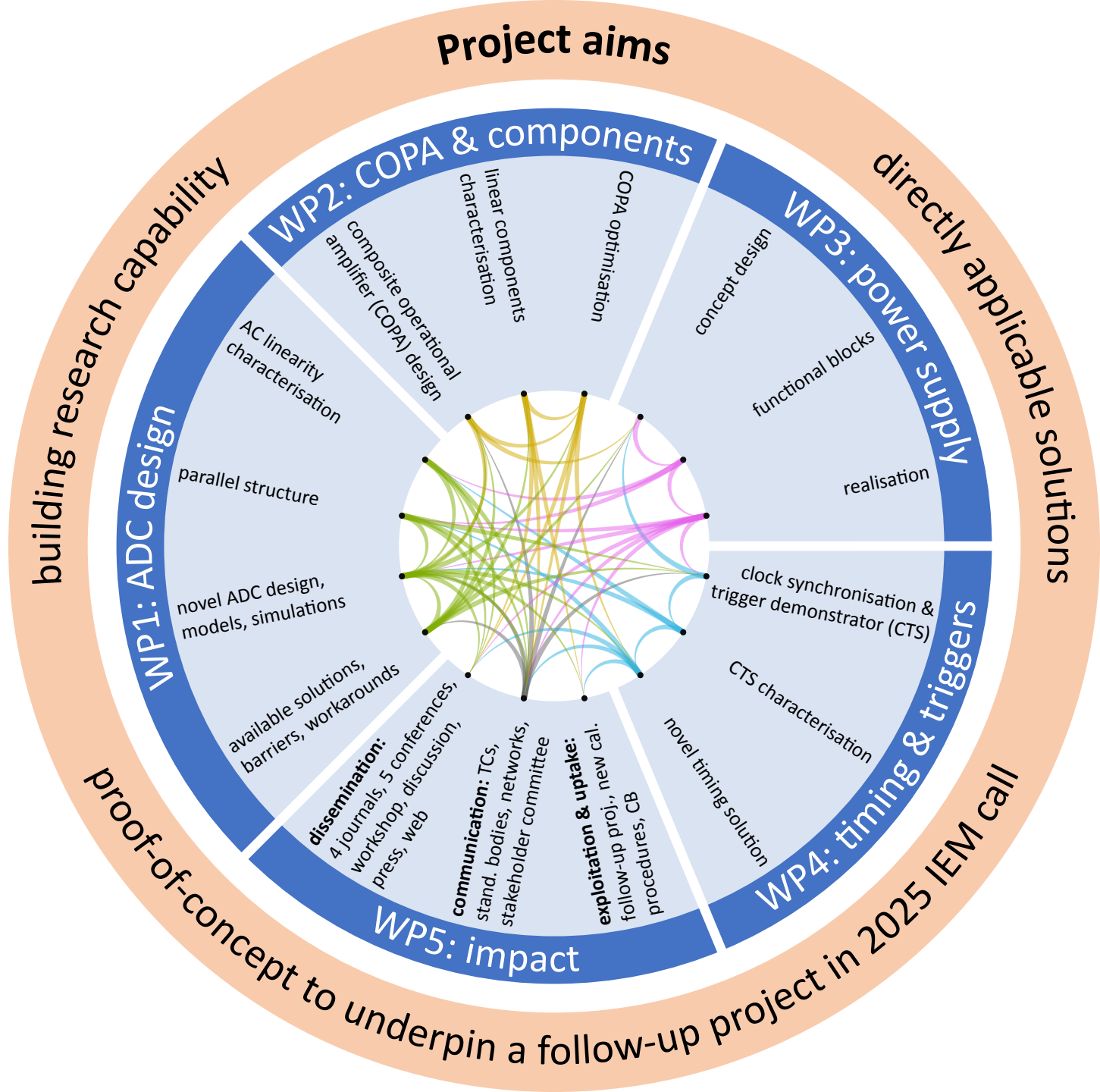
1st: Research potential to demonstrate key solutions and breakthroughs (this project)

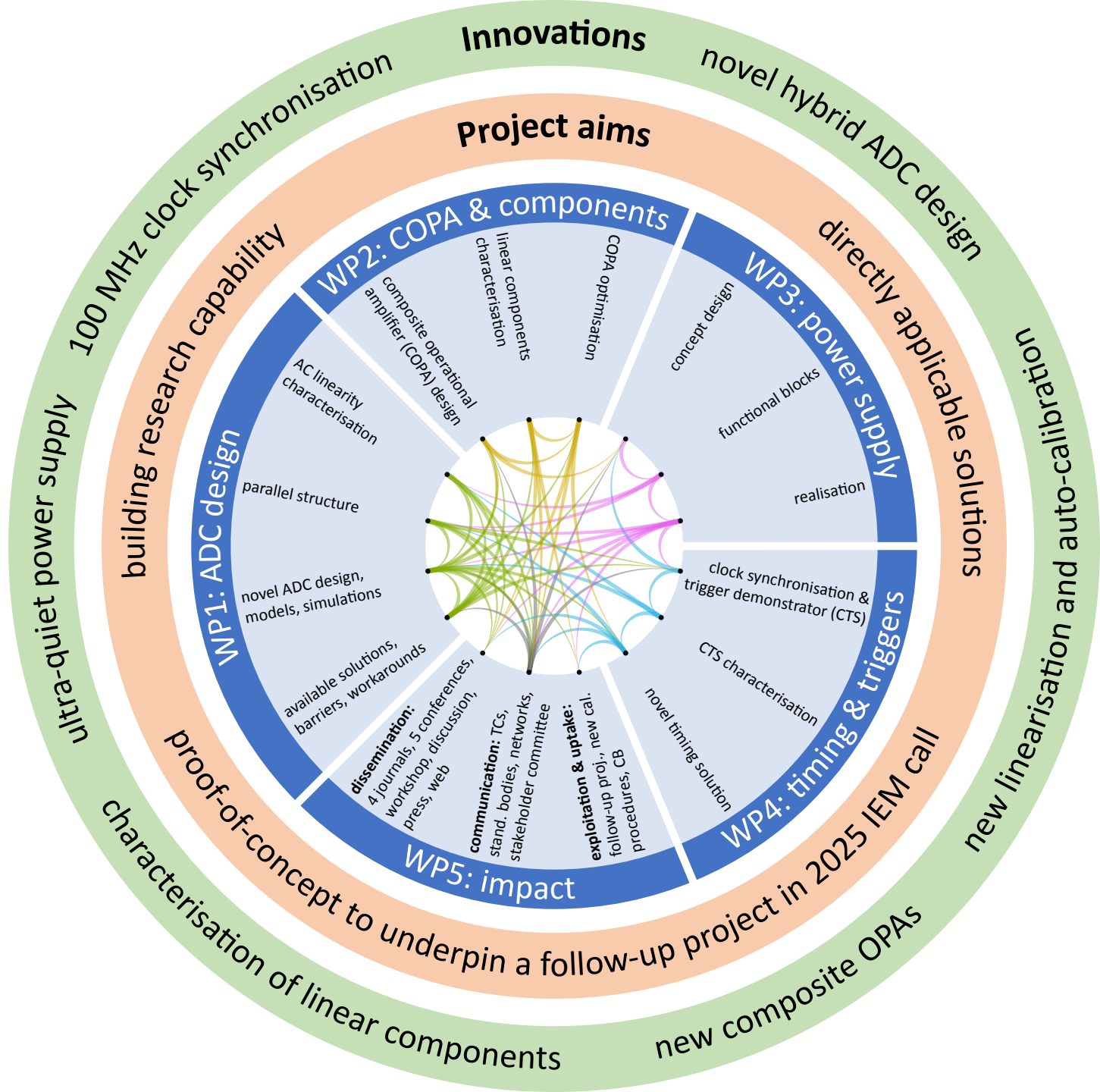
2nd: Develop functional metrology grade digitiser through 2025 IEM call (if this project delivers)

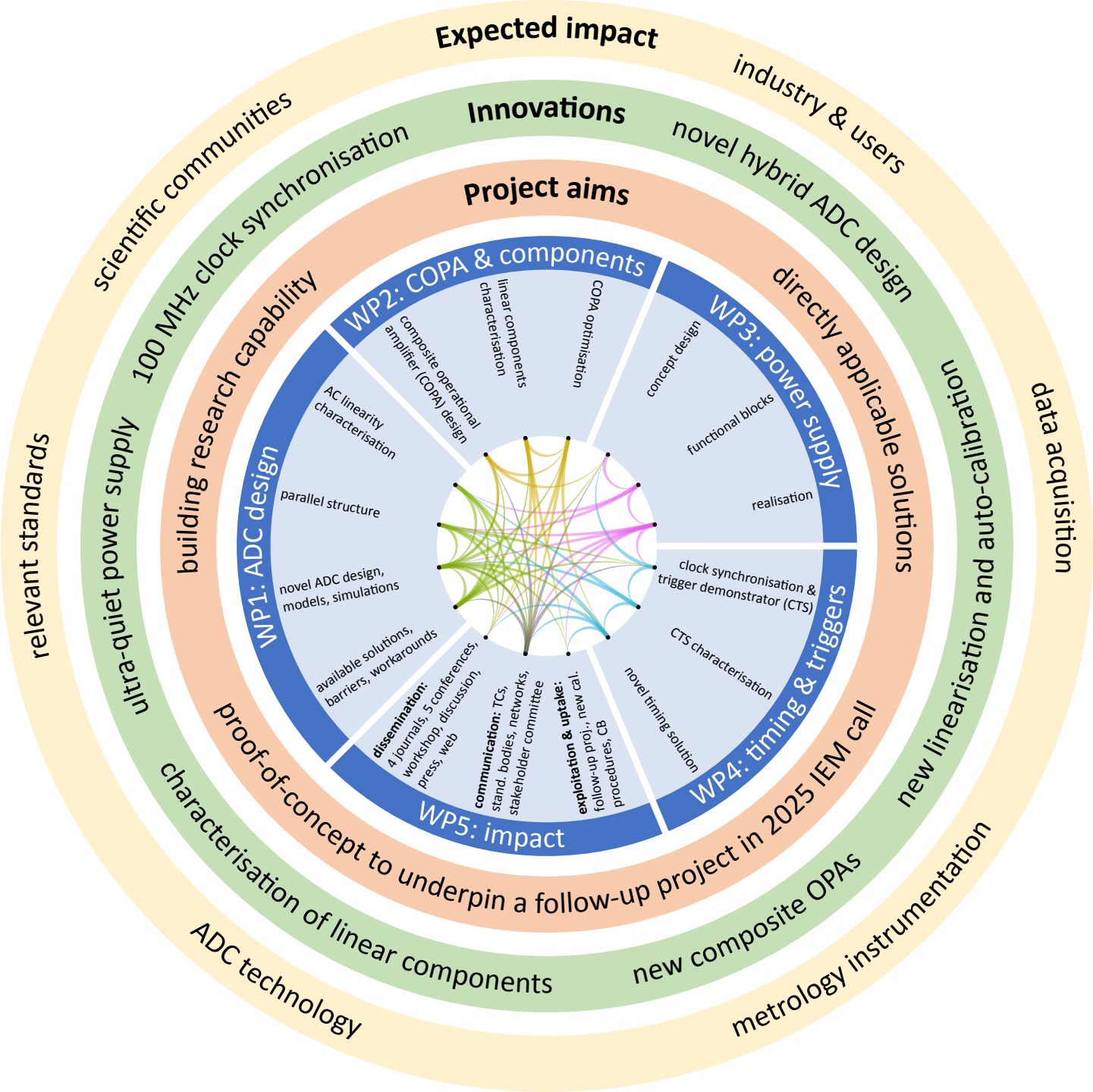
PROJECT STRUCTURE











PROGRESS

Submitted to I2MTC 2024:

A. Belcher and L. G. Palafox

Measuring Wideband Nonlinearity in Analog to Digital Converters

- Measuring nonlinearity of Audio Precision APx555 ADC down to 22 effective number of bits (ENOB) using a two comb spectra test signal.



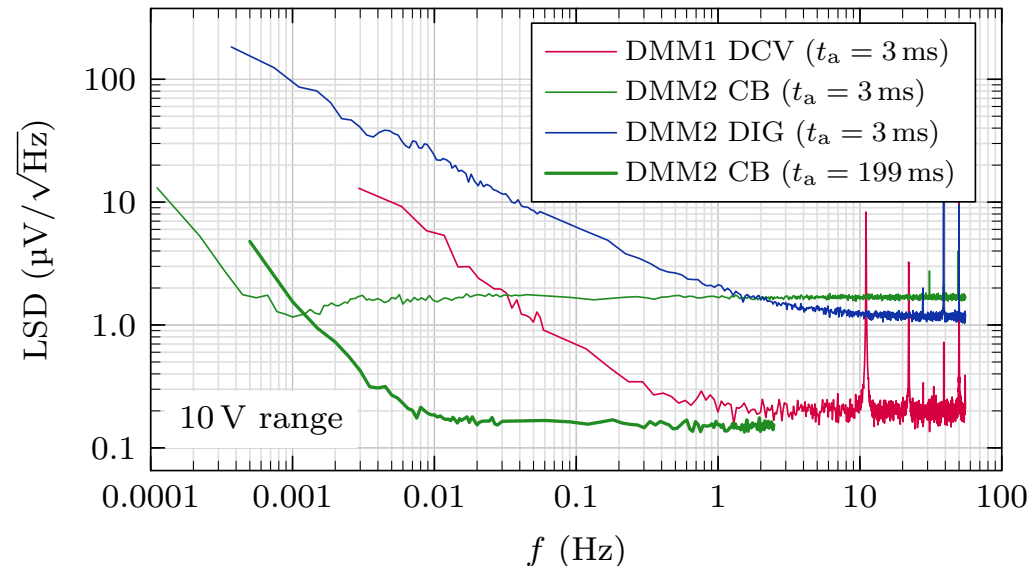
PROGRESS

Submitted to CPEM 2024:

R. Lapuh, J. Kučera, J. Kováč, and B. Voljč

Digital Multimeters Sampling Performance Comparison

- Noise and AC linearity comparison between Keysight 3458A and Fluke 8588A DMMs



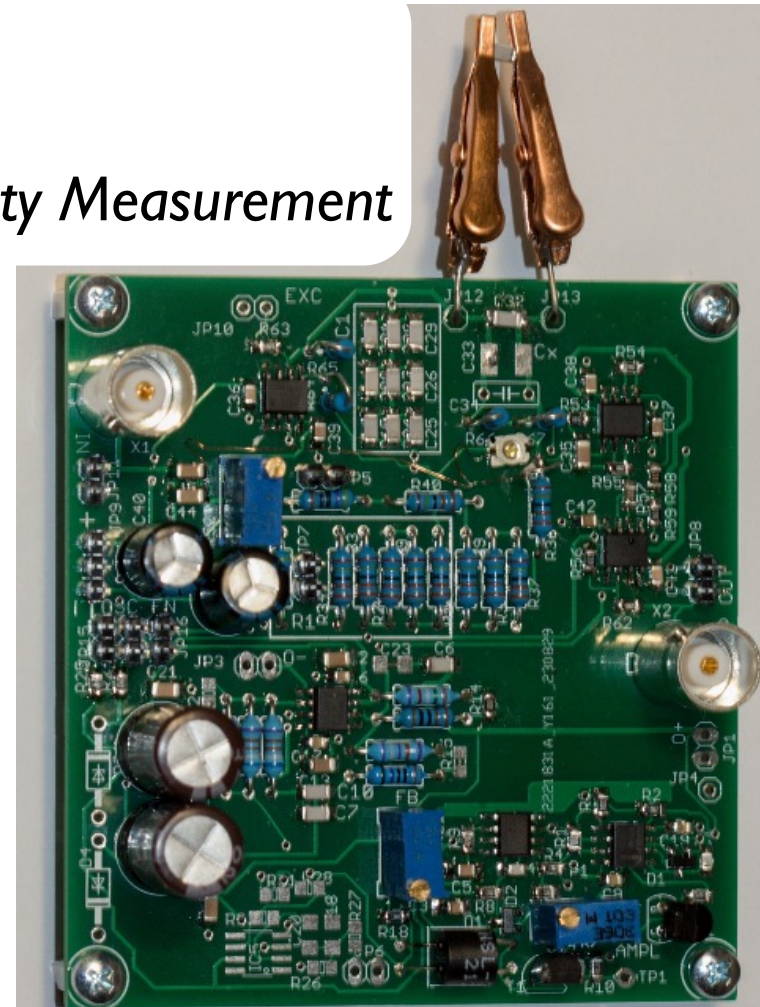
PROGRESS

Submitted to CPEM 2024:

V. Janásek, N. Beev, B. Voljč, and R. Lapuh

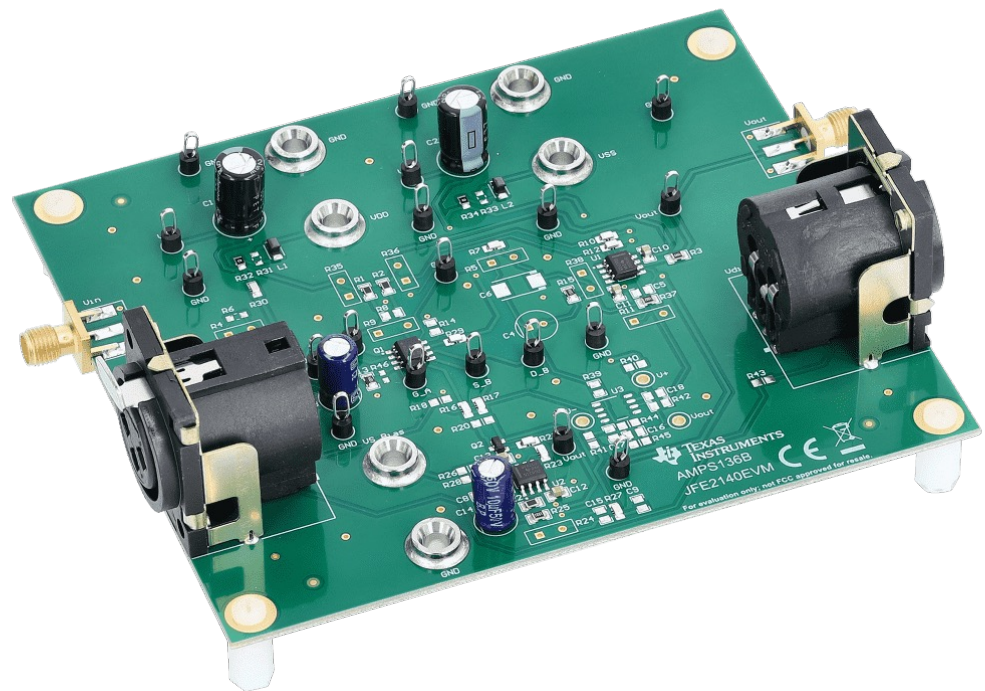
Quadrature Bridge for Capacitor Non-linearity Measurement

- A novel bridge for capacitor nonlinearity measurement down to -160dB , using a common bench source and oscilloscope.



PROGRESS

We are modelling input circuitry, striving for lower noise and lower drift than 3458A, while also characterising performance of the latest JFET matched pair transistors



PROJECT PARTNERS

from experienced ... **Project partners** ... to capacity building



COLLABORATORS

- Vojtěch Janásek (JanusCard)
- Jaromir Sukuba
- John Pickering (Metron Designs)

- New collaborators welcomed!

STAKEHOLDERS | SUPPORTERS

Stakeholders and collaborators



TECHNISCHE UNIVERSITÄT
ILMENAU



GUILDLINE

meatest

JanasCard



National
Measurement
Institute



FFI Forsvarets
forskningsinstitutt
Norwegian Defence Research Establishment



REPUBLIC OF SLOVENIA
MINISTRY OF THE ENVIRONMENT AND SPATIAL PLANNING
SLOVENIAN ENVIRONMENT AGENCY

MORE INFORMATION

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THANK YOU

