CPAD RDC9 R&D plans

Introductory remarks by

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Big ideas as of November 2023

- New materials optimized for different applications (high occupancy, precision time stamp, scalability (cost effectiveness, large masses), optimum resolution, high radiation.
- Sensor technologies:
  - Scintillators
  - Maps – use of CMOS technology for large scale structures
  - Ultrafast silicon (diamond, SiC..)
  - Metamaterial for tunable optical properties
- Optical coupling/light extraction
- Photon detection (interface with photon detector rdc)
- ASIC needs (energy & time measurement, waveform sampling, feature extraction, preservation of signal integrity in high occupancy events, interface with ASIC rdc, picosecond timing RDC)
- Large scale system (electronics/mechanics)

Communication and resources

- For documents to be shared with other RDCs
  - rdc-google drives
- For internal discussion
  - RDC9-white papers

  - Official web page should be available soon

Calorimetry R&D proposals – where are now

White Papers	Subject	Main Proponents
Novel geometry HCAL	5-D calorimeter design for optimal performance with AI/ML	A. White
time & high-granularity HCAL	The ADRIANO3 Triple-Readout Calorimetric	C. Gatto et al
Allegro LAr	FCC Detector R&D Program: EndCap Calorimeter Concept	J.Rutherfoord and E.Varnes
Calvision	Maximum information calorimetry	B. Hirosky et al
Digital hadron calorimetry	Calice-style HC	Bikki/Yonel
Maps	High-granularity sampling calorimeter	J. Brau (Oregon/SLAC)
Ultrafast silicon and other SC	Ultrafast material for sampling calorimeters/timing layer/HID	M. Artuso (at the moment idea being discussed with RDC3,RDC11)
RADiCal	modular test system for high performance, ultracompact, sampling EM Calorimetry	R. Ruchti
Radiation-Hard components	Scintillators/wavelength shifter (target fluence?)	Bikki/Yonel
Inorganic scintillators	Optimized for different specs	Zhu
Secondary emission active media	New materials for this application	Bikki/Yonel
Scintillator material for large calorimetry	Scalability for 3D projection chamber	G. Yang et al.
Theia	A broad physics program multiple R&D	Theia collaboration

Items for discussion

- ❑Some of the whitepaper are reports from well-established collaborations, some are new ideas
- ❑Are any of the proponents interested in incorporating their ideas within the framework described on page 2?
- ❑Any interest in broadening the collaborative efforts in a coherent ~5-year plan?
- ❑Ongoing dialog with RDC3, we are starting discussion with RDC11, ASIC-development and infrastructure (mechanical/electrical) key as well.

The End

Towards a calorimetry program - 2024

Note: this year is different as no RDC specific FOA and dedicated funding available

2. FY 2025 HEP Comparative Review: HEP expects to convene merit review panels in November 2024 for research areas **(a)** through **(g)** below. Research applications, as described above, that are aligned with one or more of those research areas and are received **before** September 5, 2024, will be considered for merit review by those panels. Applicants are strongly encouraged to submit pre-applications prior to August 1, 2024.

This year more limited funding and less time to develop a proposal, first trial run