IPHC

1) ses contributions au mid-term review report (quels articles en préparation, quels résultats)

2) ses propositions de contribution aux DRD à venir, en détaillant le personpower (physiciens, ingénieurs)

3) ses participations aux futurs workshops (FCC et ECFA)

4) l'état des stages et les contributions pour le jamboree prévu le 7 Juillet après-midi.

Reminder: Milestones defined/proposed by DRD3

Integration of 1st R&D phase performance in full 4D devices for stategic progams of the 2040 decade

Ball park generic performance targets* mandatory/desireable

Milestones	Tracking VD/CT	Timing Layer + Calorimeter
Heavy Ion	**M1** ultralight low power tracker pitch 10 - 30 µm @ O(100) MHz/cm^2, O(1) µs	**M2** O(20) ps (TL)
Flavour collider	ultralight low power tracker pitch 10 - 30 µm @ O(100) MHz/cm^2, O(1) ns	O(20) ps in (TL)
Lepton collider	**M5** e-e : ultralight low power tracker pitch down to <10 µm, @ O(100) MHz/cm^2 timing driven by power dissipation µ-µ : O(20) ps rates and irradiation tbc	**M6** O(10) ps in TL O(< 50) ps in calorimeter driven by power dissipation
pp collider	**M3** HL-LHC: 25-50 µm @ O(5) GHz/cm^2 5x10^{15} to 5x10^{16} neq/cm^2, 250 - 500 MRad timing O(<50) ps **M7** FCC-hh: < 10 - 20 µm @ 30 GHz/cm^2 4D tracking O(<10)ps up to O(10^{18}) neq/cm^2, up to O(50) GRad	**M4** HL-LHC: pitch O(<1) mm O(20) ps in TL, NIEL 5x10^{15} **M8** FCC-hh: 5D calorimeter O(<10)ps up to O(10^{18}) neq/cm^2, up to O(50) GRad

* ranges representative, ex. for VD and CT with more stringent constraints to be achieved in VD

(D. Contardo)

Personnal view:

- M1 (2028): is a first stage for lepton colliders (time resolution, pitch and power constraint relaxed)
- M5 (2034-35):
  - interest of 10 µm pitch not demonstrated (~15-20 µm enough ?)
  - milestone probably too far ⇨ needs to be scheduled earlier

2) contribution aux DRDs: DRD3/DRD7

- IPHC involved in DRD3/DRD7 targetting CMOS TPSco 65nm technology R&D
  - ✓ (2024-28) FTE/year projection: permanent/non permanent

Lab	Involved experiments related to DRD3/DRD7	CMOS	Time /Energy	Radiation	Non silicon (Diamond)	interconnect	Characteri-zation technics	outreach
IPHC	ALICE, CMS, Belle II, CBM-MVD, e+e- colliders (FCC, ILC, etc.)	15♦/3.3*				0.5*	0.2/0.2	0.2

* = To Be Confirmed
♦=includes all R&D CMOS activities

Strong interest | **Expressed interest** | **No expressed interest**

- One expression of interest submitted with M1/M5 main driver
  (future lepton colliders vertex detectors)
  - Goal: gather groups to reach a critical size
  - Targets 3 μm spatial resolution, improved time resolution (5-500 ns), controlled Power (< 50 mW/cm^2), data flow (10-100 MHz/cm^2) and low material budget (50 μm thickness)
  - Demonstrator to equip new generation beam telescope
  - Proposing Institutes: CERN, DESY, IPHC, APC, etc.
  - Open to other participations
  - ✓ Other projects in discussion (tracking, timing, calorimeters)
- Discussion about funding in the coming months

DRD project: Fine-pitch CMOS pixel sensors with precision timing for vertex detectors at future Lepton-Collider experiments

DRD technology area

DRDT 3.1 - Achieve full integration of sensing and microelectronics in monolithic CMOS pixel sensors.

Proposing participants

Institute	Contact	Foreseen main areas of contribution
APC Paris	M. Bomben	Simulations, testing
CERN	D. Dannheim	Testing, DAQ, ASIC design support
DESY	S. Spannagel	ASIC design, testing, DAQ, simulations
IPHC Strasbourg	A. Besson	ASIC design, testing
Oxford University	D. Hynds	Testing, simulations
Zurich University	A. Macchiolo	Testing, DAQ, simulations

3) participations aux futurs workshops (FCC et ECFA)

- Workshop ECFA WG3: topical workshop on tracking and vertexing (May 30th-31st)
  - ✓ 4 attendants, 2 presentations
- FCC physics week (London, June 5-9th)
  - ✓ 2 attendants
- FCC pheno workshop (July 5-7th)
  - ✓ TBD
- GDR intensity frontier: détecteurs à pixels (Marseille sept 20)
  - ✓ >3 attendants ? 3 presentations ?
- 2023 ECFA Workshop on Higgs/EW/Top factories in Paestum (Salerno) / Italy from 11 - 13 October 2023.
  - ✓ TBD
- workshop FCC France du 22 au 24 novembre à l'IPHC.
  - ✓ ~ 4 attendants