



# Proposal/Expression of Interest for a “french” contribution to a vertex/inner tracker detector based on CMOS pixel sensor

# Proposal for a « french » contribution

- Would include international partners (DESY, CERN, etc.)
- Technology: CMOS pixel sensor (probably the generation after TPSCo 65nm)
- Geometry partly determined by the main tracker
  - ✓ Adaptable to any detector concept
  - ✓ Minimized material budget ( $\sim < 0.15\% X_0$ )
    - Beam pipe radius/mat. budget fixes the requirement
  - ✓ Spatial resolution  $\sim 3 \mu\text{m}$  / layer
  - ✓ Time resolution:  $< 500 \text{ ns}$
  - ✓ Air flow cooling
  - ✓ Timing measurement capabilities ( $< 100 \text{ ps}$ )
    - Either in a specialized/dedicated layer
    - Or preferably included in the same technology if R&D allows it
  - ✓ 5-6 layers in the inner radius ( $\sim < 6-10 \text{ cm}$ )
    - Robustness / standalone tracking
    - Double sided option considered
    - « long barrel » preferable
  - ✓ Other pixel layers close to the main tracker
  - ✓ Inner layer as close as possible to the beam pipe
  - ✓ Stitched sensor
    - At least in the z dimension
    - Bent sensor considered (caveat acceptance)

CLD and IDEA Vertex Detectors designs (superimposed)

