General VTX workshop
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TDR discussion

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- → TDR contents & potential schedule
- → Expected technology demonstrators

TDR content

- Assumptions
  - Discussion today: the VTX chapter
  - Other chapters where VTX contribute: performance, DAQ/Control, trigger
  - Some harmonisation with other sub-detectors
    but VTX, so far, only full new detector
  - TDR followed by: construction readiness review (possibly another document)
  - TDR is not only and mainly for review + fund-requests
    also Published document reflecting our design, to be used as reference (for a long time)

TDR content

- The "full story"
  - *LHCC standard (courtesy of Francesco)*
  - **Detailed description** and design of all components, includes construction/installation plan
  - Detailed **budget** and **risk** register with mitigation plan
  - **Person-power** required & available
  - **Descoping** options (full funding not reached) with implication on performance
  - **Project structure**: management & organisation & responsibilities, structure of work-packages, schedule, milestones, decision making, contingency
  - **Money matrix and funding profile** (confidential appendix)

TDR content

- Potential & early table of content

1. Overall concept
2. Detailed concept
   a) Data reconstruction algorithm?
   b) Sensor
   c) iVTX ladder
   d) oVTX ladder
   e) DAQ
   f) Trigger
   g) Monitoring
   h) Mechanical structure
3. Construction (validation+assembly) and installation

<= construction included in "concept" section?

4. Project structure (see previous slide)
5. Resources (budget, person-power, risk)

TDR schedule

- **Mid-2027**: TDR document ready for Belle II internal review
- **May-Jun 2027**: internal VTX commenting / amending
- **Jan-May 2027**: Some complementary results accepted
- **Jan-Apr 2027**: VTX chapter writing
- **Jan 2027**: Main results from demonstrators & design drawings complete
- **Nov(?) 2026**: ToC of VTX chapter detailed, *discussed in VTX general workshop*
  writer associated to each section

Technology demonstrators

Items in following slides are open for discussion

Milestones & Schedule discussion in next session

- Performance and data reconstruction
  - Detailed simulation, compared to beam test results
  - Hit reconstruction
  - Tracking
  - Trigger: L1 and HLT <= possibly in general section
- Sensor
  - OBELIX-1 => see list of expected tests from Tuesday discussion
  - QA tests with probe-station described

<= result updates expected in 2027

- WG6 demonstrator
  - Stable operation of single-OBELIX planeS in telescope

Technology demonstrators

- iVTX
  - Mock-up RDL
    - IZM prototypes
    - In-house (Bonn) prototypes

    <= # proto large enough to assess robustness?
  - Mock-up flex-option
    - Plan, contributors ?

    <= Do we stick to 4sensor-block diced from wafer?
    <= Can oVTX flex effort be useful?
  - Mock-up thermo-mechanical ladder
    - TPG option: 1 ladder heaters+silicon+TPG+fingers+block
      sector with multi ladders?

      <= Which tests?
      <= with RDL or flex?
    - Pipe option:

      <= Any plan?
    - Air option: a priori discarded BUT use of simu/measurement comparison in transport-box
  - Validation & Assembly procedure ?

Technology demonstrators

- oVTX
  - Omega support stiffness demonstrated
  - Cooling power with single tube demonstrated

    <= further stiffness-thermal combined validation?
  - Aluminium flex fabrication

    <= which validation?
  - Sector L3/4+5+6 with ~2 mechanical ladders built
  - Draft assembly procedure with mock-up material (bonding?) on 1 ladder

    <= no reproduction study?
  - Support & connection to manyfold demonstrated by drawings

    <= good enough, mock-up model?
  - Integration within IR demonstrated by drawings

- Multi-sensor module (iVTX & oVTX)
  - OBELIX-1 a priori too late for any detection module with flex/RDL
  - Validation of multi-sensor read-out: 4-sensor RDL and/or flex?
  - Possible PCB with 4-sensor?

Technology demonstrators

- Overall mechanical structure
  - *So far, no real coverage*
  - Need at least full design! <= good enough?
  - Installation: copy VXD-procedure?
- System
  - lpGBT validated for VTX use
  - Basic read-out chain lpGBT + VTRX+ + ? demonstrated
  - Back-end decision / demonstration?
    - Trigger & DAQ
  - Powering, grounding plan established <= any demonstrator?
  - Monitoring system described <= any demonstrator?
  - List of services established <= detailed specifications?