

AIDA 2020

Advanced European Infrastructures
for Detectors at Accelerators

Advanced Software (WP3) summary

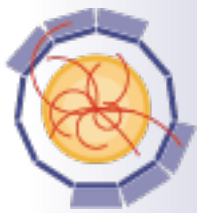
- slides shown at SC meeting
- brief report from SC meeting

Frank Gaede, Witek Pokorski

23.11.2018

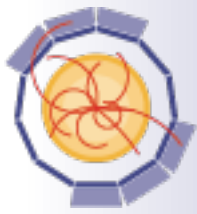


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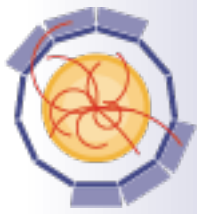
MS3.1	Design document for alignment Toolkit with tight coupling to DD4hep	3, 15	M14	✓	Reviewed by StCom
MS3.2	Design document for Event Data Model toolkit	3, 5	M14	✓	Reviewed by StCom
MS3.3	Design document for parallel algorithm scheduling mechanism	3	M14	✓	Reviewed by StCom
MS3.4	Running prototype of USolids using SIMD instructions	3	M21	✓	Released, documented and running prototype
MS3.5	Running prototype for alignment Toolkit	3, 15	M21	✓	Released, documented and running prototype
MS3.6	Running prototype for parallel algorithm scheduling mechanism	3	M21	✓	Released, documented and running prototype
MS3.7	Running prototype for Geant4 based simulation toolkit	3	M21	✓	Released, documented and running prototype
MS3.8	Integration of USolids extensions for vectorisation in Geant4, ROOT and Geant Vector Prototype	3	M44		work in progress software release
MS3.9	Application of alignment toolkit to external tracker for PCMAG	3, 15		to be delayed	Document describing alignment procedures and results
MS3.10	Application of Event Data Model toolkit with high performance I/O to Linear Collider	3, 5	M44		work in progress release
MS3.11	Integration of parallel algorithm scheduling mechanism in Gaudi, Marlin and PandoraPFA frameworks	3		to be delayed	Documented software release
MS3.12	Application of advanced Particle Flow algorithms to CMS and LBNE	3	M44		work in progress release

D3.1	Implementation of extensions in USolids (<i>extended signature of classes, reviewed algorithms, well defined interfaces for Geant4, Root and Vector prototype</i>)	3	CERN	other	PU	✓	M32
D3.2	Implementation of DD4hep extensions (<i>added alignment functionality and thread safety</i>)	3	CERN	other	PU	✓	M34
D3.3	Alignment Toolkit (<i>generic toolkit with tight coupling to DD4hep</i>)	3	UNIMAN	other	PU	✓	M36
D3.4	Event Data Model toolkit (<i>creation of EDM model in C++ with high performance I/O</i>)	3	DESY	other	PU	✓	M40
D3.5	Parallel versions of event processing frameworks (<i>validation of parallelisation of algorithms and event processing</i>)	3	CNRS	other	M56 <-		M42
D3.6	Geant4 based simulation toolkit DDG4 (<i>modular and flexible toolkit based on DD4hep and Geant4</i>)	3	CERN	other		✓	M35
D3.7	Advanced Tracking tools (<i>implementation of advance parallel track finding and fitting algorithms</i>)	3	DESY	other	M50 <-		M39
D3.8	Advanced Particle Flow algorithms (<i>implemented within the PandoraPFA framework</i>)	3	UCAM	other	PU	✓	M38



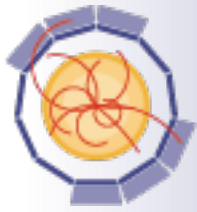
- Two tasks extended to year 5:
 - Task 3.4: Parallel versions of event processing frameworks, D3.5 postponed to M56 in the context of the project extension
 - The developments are now closely related to ongoing detector upgrade projects and would benefit from extra time for the integration into the experiments' frameworks.
 - Task 3.6 : Advanced Tracking tools, D3.7 postponed to month 50
 - justification document written and available on the AIDA-2020 web page
 - Given the large interest of the HEP community in ACTS and the comparatively large amount of manpower that had been invested by ATLAS over the last decade into these tracking tools, we feel that it would be more beneficial for the community, if we were to join the advanced tracking activities in WP3 with ACTS.

need to intensify the work on these tasks now



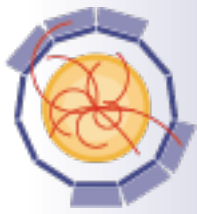
MS89	Application of alignment toolkit to external tracker for PCMAG (Implement the concrete alignment application for external tracker for PCMAG based on the Alignment Toolkit-developed as Task 3.3, Task 3.3)	9 - DESY	44	Document describing alignment procedure and results
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- MS 89 depends on
- WP15 D15.2 External Si-tracker for PCMAG
 - moved from M36 to M45, i.e. by 9 months
- suggestion (Chris Parkes):
- milestone has been met *in spirit*: alignment tools have been successfully applied to LHCb velo and to many testbeams w/ telescope
- alternative: **proposal accepted by SC !**
- move MS89 accordingly to M53
 - expect somewhat reduced support from experts (Ch.Burr moving on to other tasks)

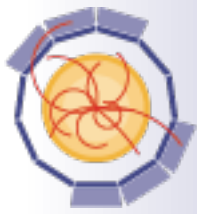


MS91	Integration of parallel algorithm scheduling mechanism in Gaudi, Marlin and PandoraPFA frameworks (Task 3.4)	8 - CNRS	44	Documented software release
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- need to move MS 91 to a later date as it depends on
- D3.5 Parallel version of event processing frameworks – moved from M44 to M56, i.e. 12 months
- suggest to move MS91 accordingly to M56
- also, we have changed the topic here from parallel scheduling algorithms to *ConditionsData-Handling*
- *do we need a justification document for this ?* yes !



- all but two deliverables done on time
- two tasks/deliverables moved to the extension phase:
 - parallel processing frameworks
 - advanced tracking tools
- will need intensify the work on these projects
- three milestones reports are in production
- work in all other projects **continues** – despite deliverables and milestones met, e.g.
 - DD4hep in production use by ILC, CLICdp and others, under investigation by LHCb and CMS
 - Usolids/VecGeom included in Geant4 and ROOT: development continues
 - Alignment tools actively used by LHCb
 - ...



- need to prepare work programme for year 5
 - => **continue all tasks – intensify work on postponed tasks (tracking and parallel frameworks)**
- P2 technical and financial report approved
 - needed to explain over-spending in EC and matching funds
- discussion on 2020 calls expected to start in November 2018
 - nothing received yet
- lack of publications
 - **do we have any in WP3 that are not yet send to the AIDA2020 management ?**
- need for more outreach topics:
 - **do we have some nice results for outreach ?**
- budget: underspending might be an issue:
 - all money must be spent by April 2019
 - in WP3 UCAM (<40%):
 - is this reporting only or are is additional spending and work planned ?
 - parallelisation of PandoraPFA ?