MDI Input for WBS

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WG2-BDS Meeting
12.05.2021

MDI in WG3

IDT-WG3 - Physics and Detectors

- The Working Group 3 is in charge of the physics and detector activities. WG3 aims to raise awareness and interest in the ILC development and expand the community, support newcomers to get involved in physics and detector studies, encourage new ideas for experimentations at the ILC.
- Chair: H. Murayama, Deputies: J. List, C. Vallee

Working Groups

- Physics Potential and Opportunities
- Detector and Technology R&D
- Software and Computing
- Machine-Detector Interface
  - Conveners: R. Poeschl, Y. Sugimoto, KB
  - Identify all machine/detector interface issues to be addressed by the Prelab to finalize the ILC design (e.g. interaction campus, experimental hall, interaction regions, operating scenario), through a forum of exchange of information between machine and detector requirements, and study their implications for the experiments design.

Topics with direct impact on physics

Item	Deliverables	Related area and technical systems	Comment	in WBS
Polarimeters	Performance specification; Costing	BDS(MDI)/Instrumentation/ADI/M	Physics instrumentation	y
Energy spectrometers	Performance specification; Costing	BDS(MDI)/Instrumentation/ADI/M	Physics instrumentation	y
System design of Muon collimation	System design	BDS/MDI/ADI	Physics impact; backgrounds	y
L* and crossing angle	System design	ADI/CFS/MDI/BDS	Physics impact; detector design	y
Collimation and detector background evaluation (incl. Muon)	Performance specification	BDS/MDI/ADI	Physics impact; backgrounds	y
Radiation loss evaluation in dump line / backscattering from dump	Performance specification; System design	BDS/ADI/CFS	Physics impact; backgrounds	y
MPS collimators	System design; Performance specification; Costing	BDS/CFS/MDI	Physics impact; backgrounds	y
Muon spoiler and muon wall	Component design; Costing; Cooling water estimation	BDS/Magnet/MDI	Physics impact; backgrounds	y

Topics with impact on detector design

Item	Deliverables	Related area and technical systems	Comment	in WBS
Anti-DID (detector solenoid)	Component design	**BDS(MDI)**/Scmagnet/MDI	Detector design	y
System design of push-pull scheme	System design	**BDS(MDI)**/CFS/ADI/MDI	Detector design	y
System design of Packman	System design	**BDS(MDI)**/CFS/ADI/MDI	Detector design	y
QF1 SC magnet and cryostat package	Component design; Costing; Power estimation	**SCmagnet**/MDI/BDS	Detector design	y
He transfer line (from cryogenics to service cryostat)	Component design; Costing; Power estimation	**SCmagnet**/MDI/BDS	Detector design	y
Power supplies, and cabling for SC magnet	Costing; Power, cooling water estimation	**SCmagnet**/BDS	Detector design	y
Magnet support	System design; Costing	**Alignment**/Magnet/BDS	Detector design (QD0/QF1)	y
Chamber support	System design; Performance specification; Costing	**Alignmrnt/**Vacuum/BDS	Detector design (IR area)	y

CFS topics with impact on detector design, assembly, maintenance

Item	Deliverables	Related area and technical systems	Comment	in WBS
Site planning: IP Campus	Requirements from detectors, area plan	CFS/MDI/Campus Planners	Detector design; assembly	n
System Design of Gantry Crane	System design; Costing	CFS/MDI	Surface area design; detector assembly	n
Design of Assembly Hall	Optimisation	CFS/MDI/Campus Planners	Surface area design; detector assembly and maintenance	n
Requirements for Pre-assembly building	Requirements, area plan	CFS/MDI/Campus Planners	Surface area design; detector assembly and maintenance	n
Design of unterground detector hall	Optimisation	CFS/MDI/Campus Planners	Underground area design; detector assembly and maintenance	n
Site planning: Main Campus	Requirments from physics/detector community	CFS/MDI/Campus Planners	Physics/detector users	n

Topics with indirect impact on MDI

Item	Deliverables	Related area and technical systems	Comment	in WBS
Alignment for two beamlines around detector area	System design	**Alignment**/MDI/CFS/BDS	IR design	y
Optics design for QD0 package design (for WP-16)	Beam optics design	**BDS**/SC magnet/MDI		y
Optics design for QF1 package design (for WP-16)	Beam optics design	**BDS**/SC magnet/MDI		y
Optics design for Crab cavity (for WP-3)	Beam optics design	**BDS**/SCRF/MDI/ADI		y
Laser station for polarimeters and laser wire monitors	System design; Costing; Power, cooling water	**Instrumentation**/CFS/BDS/MDI		y

Summary

MDI Group is established in WG3 (Physics/Detectors)

- overlap with WG2

Group structure

- Task forces
  - IP Campus and Detector Hall design
    - T. Markiewicz, M. Stanitzki, Y. Sugimoto, KB
  - BDS impact on physics (L*, backgrounds…)
    - R. Poeschl (convener)

Resources

- very limited resources do not allow to proceed with all identified topics
- work plan for pre-lab and EDR phase has not been established yet