2009/05/18

Q1 - Numerics: Please, check the summary table (MDIsummary.xls) and correct any factual errors, or provide the missing numbers, in particular, for the items that follow –

See xls-table.

Q2 - Footprint: Please, indicate the envelope (or footprint) that the detector has to occupy during the maintenance period in the offline position.

Footprint: 20x30m (?)

Q3 - Shield blocks: Please, provide the rough size of additional shield blocks to use and their schematics (if they exist), when the detector is in the online position. The objects to consider include: pacmen, shield walls, others.

No additional shield is needed outside the detector barrel. “Pacman” shielding between detector and hall depends on the needs of both detectors. Conceptual studies (Sanami et al.) show that 3m of concrete and 0.5m of iron are needed. A common solution for a “Pacman” which would fit to ILD and SiD (and most probable also the 4th concept) is under development in a joint cross-conceptual effort.

Q4 - Platform and height: Please, indicate the assumed height of the platform beneath the detector, its size, its weight, and the assumed beamline height relative to the detector hall floor.

No detailed studies of the platform have been performed yet but experience from CMS has been studied. A concrete platform of 15x20x2 (W x L x H) has been assumed. The total beam height above the hall floor is 11m, so 9m is the beam height above the platform surface.

Q5 - Gross weight: Please, indicate the gross total sum of the weight of your detector system, including the barrel, endcaps, platforms (if any), and shield blocks.

The gross weight of the detector including the platform is ~16,600 tons. The weight of the “pacman” shielding is not included; this will anyhow be the same for both detectors and will stay in place during the push-pull operations.

Q6 - QD0: Please, indicate the Z locations of your QD0 (Zmin and Zmax) and their radius R to occupy.

At L*=4.5m including cryostat:
Z_min: 4.245m
Z_max: 7.895m

Q7- Cryogenics: Please, indicate if your QD0 and the solenoids are to operate at 2K or 4K.

The ILD solenoid operates at 4K. The QD0 magnets will be designed by the ILC BDS team and

are not under the responsibility of ILD. The present design foresees 2K helium for the QD0s.

Q8 - Push-pull motion:

a) Please, indicate the preferred method of push-pull motion mechanics that is currently under consideration.

No detailed design exists so far. Several systems are under study:
Platform: the platform just needs to perform one-dimensional movements. This could be done by several technical solutions, e.g. Hilman rollers on steel rails or airpads. The detector components can be moved on the platform and in the parking position either on airpads or also on a rail based system.

b) Please, identify the hardware components (beamline elements, shield blocks, and utilities) that need to be disconnected/disassembled and reconnected/reassembled during your detector push/pull. Please, estimate how long this relocation / reassembly work will take.

The pacman shielding needs to be opened.
The connections between QD0 and QF1 will be disconnected
The power supply for the detector solenoid needs to be disconnected from the bus bars if this solution is realized. Otherwise the supplies would run in the cable chains and stay connected.

Time estimate?

c) Assuming that the accelerator (including QF1) is in a good alignment condition, how long would it take to complete your detector “push”, and complete the alignment of the detector components. Explain how you will do this realignment; i.e. what kind of measurement and mover systems.

We estimate the time for the mechanical movement of the detector to be in the order of one day. Another day might be needed to align and re-calibrate the detector. The alignment will be done with the assistance of an interferometric positioning system, e.g. MONALISA. The calibration of the detector will be done using Z-pole data. All time estimates given here assume procedures which are optimised based on sufficient experience.

d) How long would it take to complete your detector “pull” and to make the interaction region and the BDS ready for the other detector?

We estimate the time for a “pull” operation to be in the order of one day. It is the same as for the “push” operations, but in contrary to it, calibration and alignment is not needed.

e) During the upcoming Technical Design Phase, what type of resources do you plan to allocate for the conceptual and engineering work on MDI-related issues, and how you intend to operate them? Also, do you have any requests for assistance to the RD management or to the MDI group, in terms of resource sharing or in terms of interactions on

technical matters?

The resources within the ILD group are distributed over several labs and continents. No formal central controlling of the resources is possible, so a collaborative style of work has been adopted. ILD has a dedicated MDI/Integrations working group which serves as the central communication body for these issues. It reports to the ILD Executive Board.

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