Proposal for R&D in Mechanical Engineering within PH Department – Action Item n. 8

Push – Pull and Sub-lifting

In future linear colliders it will be difficult to arrange two experimental caverns within a reasonable budget. Two experiments will most likely host the same experimental area. To change from parking position into beam position the whole experiment, with a weight up to 15000 tons, has to be moved. The switching time is given to be less than 3-4 days. This means that innovative heavy-moving techniques, joining quick moving with precise alignment, have to be adopted.

Although the actual CMS moving system that combines air-pads for long distance travel with grease-pads for approaching target points, has been fully tested, gathering important experience, it looks that it could not be just "copy-and-paste" to next linear collider detectors.

Sub-lifting is a technique of moving horizontally very big loads without quasi any vertical displacement, allowing for precision moving of heavy detector slices without involving complex surveying procedures. We are convinced that this is the way to follow in order to comply with the ambitious requirements of detectors push-pull systems.

The design of the push-pull system shall comprise as well the study of the vibration stability of the detector and its associated equipments versus the machine beam-pipe.

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