

Preliminary LDC position on a possible PUSH-PULL detector configuration at the ILC

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The LDC detector concept group in this document formulates a position on the question whether or not a push-pull arrangement for the ILC detectors is feasible. The position summarised in this note is mostly the result of the work of the LDC members in the push-pull task force, Norbert Meyners, Karsten Büsser, Henri Videau, and the LDC contact people. It has been circulated in the LDC community, and contains the feedback from the community.

We like to stress that we can only give a very preliminary assessment of the push-pull configuration at this moment. The shortness of time available prevented us from a serious in-depth engineering study, as would be appropriate for this topic.

The LDC concept group stresses that we are convinced that two detectors at the ILC are of very high importance. We are convinced that two detectors, designed towards the same general physics questions, but realised in complementary technologies and designed and operated independently of each other, offer a significant advantage and, in the end, will significantly increase the scientific output and return from this machine. Any technical considerations should take into account that both detectors should be operated on an equal footing, that nothing is done which jeopardizes the operation of one or both detectors, and that the construction and operation of both detectors remains equally attractive for the community.

We have studied the feasibility of a push-pull configuration in a very superficial and preliminary manner. We have identified a number of areas of serious concern, which need significant study and engineering work to understand their impact on the design of LDC and on the eventual performance of a push-pull scheme. These areas include the design and size of the cavern, the mechanical overall design of the detector, its scheme to open and to move around in the cavern, and the designs of most of the different sub-systems, all of which will be affected by a decision to move to a push-pull scheme. We in particular are not convinced that a fast switchover between detectors is possible without losing significant time for a re-calibration of the detectors.

Many of these problems can probably be solved by a dedicated engineering effort, and if enough resources and money are spent on their solution. At this stage however we feel that we do not understand the tradeoffs between decreasing costs by eliminating one beam line, and increasing costs and risks by additional complexities for the detectors.

A possible push-pull scenario will present a significant challenge to the community to operate it in a way that both detectors are treated on an equal footing. We repeat that an equal treatment of both experiments is of utmost importance. For this a solution where a fast switching between the experiments is possible is obviously the best. Such a solution is clearly excluded in a push pull scheme. We nevertheless think however that a solution can be found to guarantee an equal treatment of both experiments also in the case of a push-pull scheme,

We request that any decision for or against push-pull should be taken under the condition that the other solution is continued to be studied in detail. We request that should the push-pull scheme become the baseline, as prepared in the recent Change Control Request, the two-beam line solution is continued to be studied, and in particular, priced, and that both prices are made available at the time the RDR is published.

In summary the LDC group is very concerned that no fast and irreversible decision is taken in favour of a push-pull scenario, in the absence of any serious study and information on the additional costs and risks such a solution implies. We do not fundamentally oppose a push-pull decision, but insist that a decision at this time can only be preliminary, and has to include the non-push pull solution as a backup.