

SiD HCal Technologies and the LOI
Andy White and Vishnu Zutshi

It is our opinion that the LoI process should serve as the mechanism by which SiD converges on a baseline design rather than starting with an arbitrary baseline which forms the basis of a LoI. This is of special relevance to the hadron calorimeter since there are multiple technologies being pursued inside the Collaboration. Our rationale for this approach is the following:

All technologies have made significant progress. However, for all of them, the picture is incomplete and not conducive to making a rational preferred choice.

None of the options, in simulations or hardware, have been shown to be unworkable or significantly better than the other.

There is no geographical 'naturalness' that can be applied to the technology choice. Both gas and scintillator options are being pursued vigorously on both sides of the Atlantic.

The schedule being espoused by the funding agencies is completely at odds with what the ILC physics community is assuming. In this situation it is rather imprudent and quite possibly unnecessary to rush in with a very definite choice.

It is thus proposed here that at the beginning of the process all options be kept on the same footing and a series of benchmarks, both software and hardware, be specified that the proponents of the different technologies have to address for inclusion into the LoI. This, in our mind, allows the different options to flourish under the SiD umbrella while building the infrastructure for making a rational baseline choice.

Operationally, we anticipate that a series of reviews will take place on HCal technologies. These reviews would be held in Spring 2008, and the information obtained included in the LOI. The criteria for the reviews is discussed in the previously distributed HCal Plan, which has been updated to reflect the specific LoI procedures. It is expected that the result of these reviews will be the determination of a baseline hadron calorimeter choice for the SiD LoI.

We are well aware that this approach may enlarge the scope of some tasks by a factor of 2. For instance the engineering for the hadron calorimeter may have to look at how a gas or a scintillator hadron calorimeter will fit into the SiD framework. In our opinion this is actually a benefit as it will give us a clear view of the common design aspects between the different options, point out points of departure and lead to a deeper understanding of the specific constraints and integration issues imposed by different technologies. All this will provide critical information in making a rational baseline choice.