

# Thoughts on SiD's Future



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# Not Done Yet

- Completion of the Lol is within sight, but fundamental, unanswered questions about SiD's design and the need to prove SiD's technologies remain.
- Lol, IDAG, and Validation dominate SiD's immediate future:

Pre-Lol	March 31
Pre-TILC09	April 17
Pre-IDAG Review	June 22
Pre-Validation	September 29
- Full Technical Design comes next

# SiD's New Tools Can Answer Fundamental Design Questions

SiD has developed powerful tracking and calorimeter reconstruction tools, costing methods, benchmarking code, and infrastructure. Important questions can be answered:

Using the benchmarking analyses:

*How important is jet energy resolution for the physics?*

*Any chinks in SiD's armor?*

Using Iowa PFA and Marty's Excel Spreadsheet:

*What's the optimal design of SiD?*

Stretched?  $5\lambda$ ? Hcal segmentation 1 cm<sup>2</sup>?

# Fundamental Design Questions

- How does SiD perform at High Energies?  
What jet energies must we measure?  
What jet energy resolution do we need?
- PFA or Dual Readout Crystals?
- Can SiD handle CLIC backgrounds? CLIC physics?

# Detailed Design Questions

Using Rich's and Dima's Tracking Code:

*What's the optimal design for the tracker?*

Using Realistic detector simulations:

*Do cracks and dead spots in the calorimeter matter?*

*Does the tracker material degrade jet  $E$  resolution?*

*Can we really track amidst expected backgrounds?*

If the big questions are the carrot, performance before the IDAG is the stick.

## Immediate Future: Pre-Lol

Lots to finish up and do, write and edit.

- Get it to the editors by March 20.
- Use the current latex source for your modifications.  
We owe it to Mark.

## Pre TILC09 (April 17)

- Not everything we'd like for the Lol will be included
- SiD can refine results post-Lol for TILC09
  - e.g. Tracker Background studies
  - Hcal Response to High Energy
  - Improved Benchmarking Results
- New SiD results should play in the parallel sessions.

## Pre-IDAG Review (June 22)

- Refine our answers to the IDAG questions
- Tie up loose ends in benchmarking analyses
- Patch weaknesses in Lol
- Respond to IDAG questions



## Pre-Validation (Sept. 29)

- Last chance input to IDAG
- Back to basics: Detector R&D, Design Studies

# Longer Term Future: Pre-TDR

Prepare for a SiD Proposal in 2012

- Optimize design (now we have the tools!)
- *or* Radically re-design
- Demonstrate proof of principle R&D
- Select technologies
- Complete subsystem engineering
- Simulate a *realistic* detector (tracking is ready, cal next?)
- Benchmark a *realistic* detector

Doing this requires a level of support we don't enjoy today.

# SiD's Future depends on Building Support

- Help Get US LC Strategy Straight
- Grow the SiD R&D Effort.  
It could seed a real collaboration.
- Grow SiD Internationally.  
We need the help. We need the breadth.
- Get GDE Support for Detectors

The LoI and its R&D Plan make the case for funding continued SiD R&D and expanding SiD's base.

# SiD's Undercarriage

- **The SiD Collaboration** is of course the ultimate foundation for building SiD's future.
- It has withstood significant pushes and pulls and periods of minimal luminosity.
- It has a string of amazing accomplishments.
- It's Lol is a major milestone on the way to rolling onto beamline.
- Thanks to its collaborators, SiD is well positioned for the next steps, Validation and the TDR.