Future Perspective for SiD

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for the SiD Consortium

SiD/ILC Status

- The ILC project has been endorsed (EU Strategy, ACFA, Snowmass, P5) as a major future HEP project – indeed the **only one** anywhere near reality
- We have an accelerator design that will deliver the required luminosity – at a range of energies.
- We have plausible running scenarios (now H20 !) to address the range of ILC physics.
- **We have a SiD detector design that can deliver the physics** (at least at the level studied for the DBD).
- However, we still face a challenging period while the negotiations take place.

We must use this period to move SiD forward and position ourselves for an eventual real experiment.

SiD/ILC Timeline

2015 - 2016 Decision to proceed with ILC Project (otherwise it's all over)

2016 – 2018 Negotiations over funding ILC. Hopefully a period of rising investment in detectors for ILC.

2016 - 2020 Optimization of SiD (can only be completed with serious resources after project approval) and production of a Technical Design Report.

2020 – 2021 Review of TDR

2022 – 2028 Construction of SiD

2028 – 2030 Commissioning and start of data taking.

What's next?

- SiD 3-5 year goals include:

★ Optimization of the detector (physics and detector studies by physicists with input of engineering realities) –

SiD Optimization meetings take place every week – please join in and offer your ideas!

★ Further benchmark studies as new ideas/new **LHC results** emerge.

★ Detector prototype R&D completion (physicists, technicians; will require a budget)

★ Demonstrate scalability of each proposed technology

★ Ramp up towards a TDR with subsystem engineering and detector integration(physicists and engineers at a minimal level to begin, increasing with time)

What's next for SiD

- We invite you to contribute to the planning for the next steps:

  - Offer your ideas for optimization of the SiD design
  - New technologies ??
  - Involve students/postdocs in short/medium term detector and physics studies
  - Be prepared to discuss new ideas with new people joining SiD
  - Contribute to the preparation of resource requests for the TDR
  - Connect to the SiD General meetings
  - Connect to the Institutional Board meetings
  - Offer your ideas for the SiD organization moving forward
  - Give talks and talk to your colleagues about ILC and SiD !

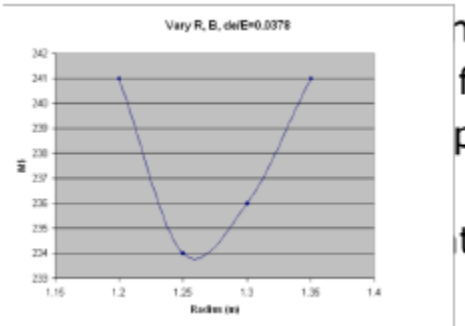
Where we need to be to start a TDR

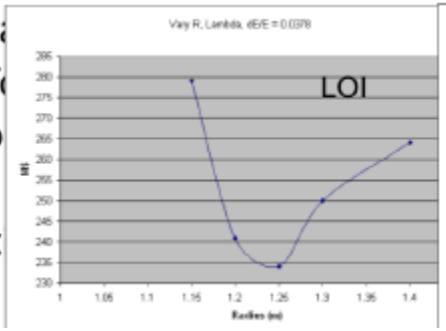
- The baseline design of SiD must be completely defined.
- Its physics performance must be well understood:
  - Cost/performance trade-offs
  - Staying away from Felix's cliffs

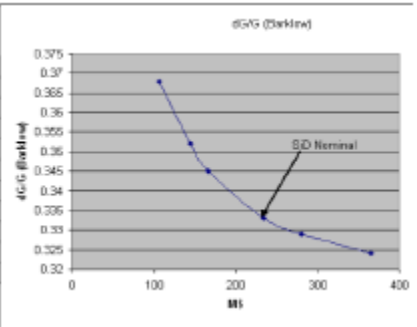
Critical parameters,
safety margins

R, B, material,…

- Being in a favorable place with respect to Marty's knees







Where we need to be to start a TDR

- We must demonstrate feasibility for the scale-up from prototypes to realistic/operational sections of each subsystem.
- The essential mechanical engineering scheme must be fully understood.
- The cost must be defensible in terms of performance and derivatives – initial choices and where we can go without seriously damaging performance.
- We must have basic resources to support:
  - Engineering studies (detector, MDI, site specific)
  - Construction and testing of technical prototypes for selected technologies
  - Physics studies to confirm performance, address any relevant new physics from LHC
  - Participation in workshops, conferences, TDR preparation

SiD

SiD Consortium exists, we have added new members in the past year.

The situation in Europe is improving – UK now has ILC as part of its program, and there is support via AIDA, RISE,…

For US we recognize the difficulties of continuing SiD development in the absence of funding, while we continue to make our case for support.

Essential site-specific studies ongoing with minimal level of support at SLAC (assembly hall, detector hall, MDI (L*,…), magnet iron, fringe field,…)

The ILC remains the only future Energy Frontier project anywhere near reality, but lack of explicit support puts realization at risk.

US investment in the ILC in Japan makes no sense without a community of interested/motivated physicists!

We have had opportunities this week, and next week, and should continue to, demonstrate our enthusiasm for the ILC, our detector concept, and the physics program!

Extra

Subsystems

A minimal list!

VTX – can afford to wait, monitor (support) ongoing new technology studies

TRK – full Si strip tracker section, beam test; mock-up of support, cooling schemes; consider alternatives.

ECal – complete full depth prototype, test planes with new layer structure, beam test, full size mechanical model of 1/8?

HCal – Detailed study of the scintillator option (many development in CALICE), full simulation, tile size study, mechanical design of barrel, endcap modules. Understand relative PFA performance of DHCAL and AHCAL.

Muon – have the long scintillator strip/WLS prototype – continue development/or hold for now?

FCal – follow collaboration developments

Software – new re-evaluation of support, new experts, documentation – make it easy to use!