

US R&D PROGRAM FOR THE 100 TEV PP COLLIDER

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(A new Fermilab WG on 100 TeV pp Collider
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Will provide input to the HEPAP Accelerator R&D subpanel.)

Strong Statements from P5

- ◆ P5 Report “Building For Discovery: Strategic Plan for U.S. Particle Physics in the Global Context” (released May 22, 2014)

“A very high energy proton-proton collider is the most powerful future tool for discovery of new particles and interactions under any scenario of physics results that can be acquired in the P5 time window.”

This provides strong encouragement for the US particle physics and accelerator communities to be thinking about R&D towards a 100 TeV scale pp collider and related detector/physics studies!

Also, consider P5 Recommendation #24:

“Participate in global conceptual design studies and critical path R&D for future very high-energy proton-proton colliders. Continue to play a leadership role in superconducting magnet technology on the dual goals of increasing performance and decreasing costs.”

Planning for P5 scenarios

◆ In P5 scenarios A and B -

- It is critical for US to continue strong R&D on High Field SC magnets
- Need to participate in Global design efforts for a 100 TeV pp collider
 - We expect interest to participate from BNL, LBL, Cornell, MSU, etc. in the FCC effort. Needs to be somewhat coordinated. (IR design, beam dynamics, collimation, photon stops, etc.) FCC is CERN-specific and not quite a global design effort.
 - The effort could be in the range of ~4-6 FTE nation-wide (TBD)
 - Also plan to participate in China's high energy pp collider activities?

◆ In P5 scenario C

- **Develop strategy and perform studies to host the 100 TeV pp collider in the US.**
- Significant effort (10-16 FTEs in the US for design work only + magnets, etc.) would be required.
- A steering group has to be formed at the appropriate time

Snowmass White paper on 100 TeV pp collider –

<http://arxiv.org/pdf/1306.2369v1.pdf>

<http://www.physicscentral.com/buzz/blog/index.cfm?postid=4835100616060881541>

Snowmass “Accelerator Capabilities” report has good discussion of the opportunities and required R&D and efforts.