Midterm summary

Snowmass 2001, July 12

Wilhelm Bialowons (DESY), Chris Laughton (Fermilab), Andrei Seryi (SLAC)
Activity highlight

• **Ground motion sessions**  
  - Fast; slow; diffusive; systematic ground motion, effect on NLC, TESLA, VLHC  
  - Tunnel and vibration interaction; influence of geology, location, depth, shallow site resonances  

• **Tunneling workshop**  
  - Two day dialog with invited experts on tunneling, design, construction, ground and site investigation  

• **Stabilization workshop**  
  - Feedbacks to stabilize beam and collisions; active stabilization of focusing elements  

• **NPSS Technology school**  
  - **July 17, PM**  

• **NPSS Noon lecture**  
  - **July 18**
Midterm recommendations
GROUND MOTION

- Investigation of slow motion at representative sites
- Investigation of vibration at representative sites
- Investigation of resonances of shallow sites
  - Maybe a reason for larger noise at some sites
- Understand effect of depth/layered ground and use it to minimize noise
  - Benefits of soft top layer and deep tunnel
- Develop / apply methods damping in-tunnel generated noises
  - Learn from LIGO
Midterm recommendations

TUNNELING

- Need for preliminary site investigation of proposed CA and IL sites (shale swelling properties, hydrology, in-situ stresses, faults)

- Need for constructability review of underground sites to ensure compatibility with contractor methods and means

- **Tunneling R&D** - be informed, but be aware that too much tunneling R&D may increase risk of the project

- International Advisory Board on Tunneling - similar to Machine Advisory Committees on accelerators

- Methodology, prioritized list of criteria - how to select a site - need to minimize number of sites (ground motion and vibration, tunneling, impact on local community; looking for guidance on getting permission on site investigation)
Come to NPSS school and lunch lecture and find out...

- How fast is “fast” ground motion?
- What is “cultural” noise and why we do not like it?
- What is diffusive ground motion?
- Why do we like deep tunnels?
Come to NPSS school and lunch lecture and find out...

• How human activity and site resonances influence ground motion amplitude?

Cultural noise & geology
Come to NPSS school and lunch lecture and find out...

- How to look ahead of a Tunnel Boring Machine?

TRT™ Reflection Imaging Ahead of TBM
Tuesday July 17, PM

Ground motion, Optimal Tunneling and Environmental Considerations for Future Colliders

Ground motion in future colliders
Andrei Seryi (SLAC)

Optimal tunneling for future colliders
Wilhelm Bialowons (DESY), Chris Laughton (Fermilab)

Conventional alignment - Now and in the future
Catherine LeCocq (SLAC)

Beam based alignment - From an art to indispensable everyday tool
Peter Tenenbaum (SLAC)

Wednesday July 18, noon

Ground motion effects in future accelerators
- what accelerator and non-accelerator physicists should know about it
Andrei Seryi (SLAC)