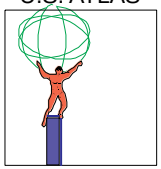
U.S. ATLAS

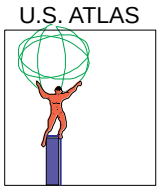


ATLAS PIXEL SYSTEM ISSUES AND CONCLUSION

M. Gilchriese

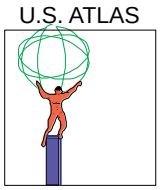
Lawrence Berkeley National Laboratory

March 12, 1999



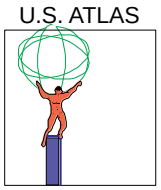
Major Technical Issues Now

- **Front-end electronics is critical path item**
  - **Can all requirements be met for system, differences for B-layer**
  - **25 Mrad or more functionality**
  - **Maintain two vendors**
- **Module performance**
  - **System stability and noise immunity**
  - **Integration of optical and power connections**
  - **Need much more experience to understand yield for all module components and assembly**
- **Reliability of cooling/mechanical system**
  - **Integration - does it fit together reliably?**
  - **System-level prototypes expensive and require coherent program across entire system, not just U.S.**
- **We believe our development program addresses these issues(and more).**



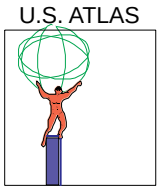
Non-Technical Issues

- **Costs**
  - As we learn more about yield of all steps needed to produce working, reliable modules, costs will likely increase
  - Scope of mechanical prototypes also rising
  - U.S. ATLAS will do cost-to-complete by early 2000, well before we had planned our baseline review
  - Should we advance our schedule to be able to have complete pixel cost estimate in time for U.S. ATLAS cost-to-complete deadline => baseline review in early 2000? Clearly the pixel contingency will be higher for earlier estimate.
- **B-layer**
  - The B-layer components(electronics, sensors, mechanics) will very likely be different than the rest of the system and decisions on these will come later than for rest of system.
  - The U.S. groups may be in a position to make unique contributions(eg. in sensors(diamond) or electronics(higher density Honeywell) or mechanics)
  - Should the U.S. contributions to the B-layer be part of the baseline in 2000? Is separate budget request remotely feasible?



More Non-Technical Issues

- **Integration engineering manpower**
  - **So far we have taken the lead on this in recognition of the need and because we have the skilled personnel**
  - **We will continue at some level, but the need for integration manpower will grow and should also include electronics/electrical issues for which the U.S. currently has the leadership.**
  - **To date all engineering personnel from collaborating institutions are supported by non-project funds and we would like to keep it this way. But this is likely to be impossible if we expand our integration/systems role now(and it's needed now).**
  - **In addition, conflict with support of the critical path item is a strong possibility at some time.**
  - **On the other hand, overall schedule delays likely if collaboration doesn't devote more people to integration.**
  - **Should we increase our role in systems integration? 1 FTE of added engineering would be required.**



Conclusions

- We hope that you are convinced that very substantial progress has been made to develop the pixel concept for ATLAS.
- It appears that the “proof-of-principle” phase is largely behind us except for a complete demonstration of the critical viability (of the electronics and modules) after 25 Mrad.
- It’s recognized that we have a lot of work to do to go from a few successful prototypes into a production mode starting (for some components) in 2000.
- But we believe our program of work over the next year and more is well formulated to meet this goal.