

From latest NuSAG communications:

14. What has actually been measured on purity of the Ar in a tank made with industrial technology? If not yet tried, when will the first tests be?

15. When do you expect to have tried 3-m drifts and long wires in the US? What effect will the capacitance of very long wires have on electronic noise?

16. What are the R&D milestones, with an estimated schedule, that would lead to a first realistic cost estimate for a detector of the 2nd-off-axis or wide-band class?

Comment:

Technical Setups

1) Material studies for long (10 ms) electron drift lifetimes: PPD

- MD, TC and SD

Clean Argon (10 ppt from few ppm) - done - MD

Purity Monitor (light source and delivery, photocathode studies) - have a system that is adequate for present studies - need to develop alternate sources for cathodes - TC

Construction of materials test station (Luke) - in process - (materials all in house, involves new cryostat, internal argon filter, system to introduce materials without pumping on them, motors and controls for above).

hope to start commissioning (nul test) by end of August;
operate for a year testing materials for large detector.

Technical Setups (cont)

2) Mini-TPC in 200 liter cryostat to demonstrate tracks - first integrated LAr system (HV, purity, tracking electronics) integration issues and develop our understanding of front-end electronics:

Electronics and simple DAQ - in process (MSU)

TPC design and construction - starting (TC)

Commissioning of 2nd cryostat (Bo) - time critical (after Luke)
(Ancillaries like trigger counters, Nim electronics - assumed to be available)

would like to start commissioning before end of the year (ie by end of November)

1 & 2 require current level of MD engineering support to be maintained, and the level of technician support to be restored to level before the shutdown.



Technical Setups (cont)

3) Achieving purity starting at atmosphere (purging studies) - demonstrated effectiveness of inserting argon slowly at bottom of tank and 'pushing' air out in a 100 cubic foot tank.
Proposal to use old village water-tank on hold.

4) (New - HJ). Detecting light with scintillator panels immersed in the argon and read out with light fibers. Previous detector concepts have not included light readout. Detecting the light would help with triggering and rejection of cosmics. Presently a summer-student project - will probably request help from TC to complete assembly.

5) Long wire studies to understand mechanical stability - on hold
(see later)

Technical Setups (cont)

6) Long (5 meter) Drift System to demonstrate and readout long drifts: integrated system; tests purity, HV (250 kV). Requisition for horizontal vessel (~\$100k) rejected: considering vertical vessel (if significantly cheaper) -

Project requires: M&S \$250k

for MD - equivalent to Luke and Bo plus assembly of a 2nd argon purification system -3 months engineering, 6 months mechanical assembly (2/3 people for 3/2 months plus shops)

for TC - construction of drift-field electrode, wire planes, trigger counters, PrM

for SD - help with motors, motor controls and HV.

Major project - real development, essential prerequisite. Would be good by end of 2007.

LARGE DETECTOR DESIGN

- 1) **Argon and Cryogenics:** purity from atmosphere, control. Good start on concepts. Critical issue in the short term - determine sensible tank to demonstrate scalability of detector design based on LNG tank technology a combination of tank/argon costs and understanding details of TPC design and how the TPC fits in the tank.
- 2) **TPC & Tank Design; how to incorporate TPC and deal with wire tensions and argon pressures** - major issue, lot of progress in few months with Y. Orlov this has stopped. New ideas for wires (pre-assembled panels) needs some analysis. Progress on 2 is issue for future of entire business.