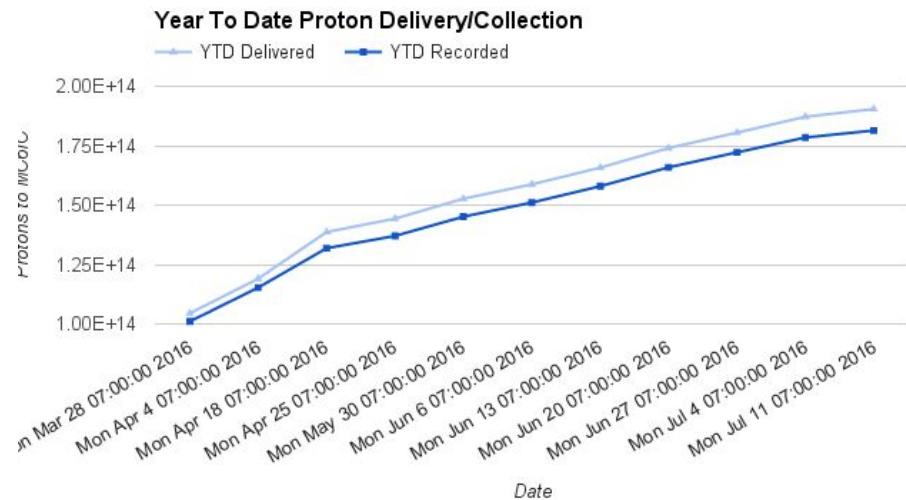
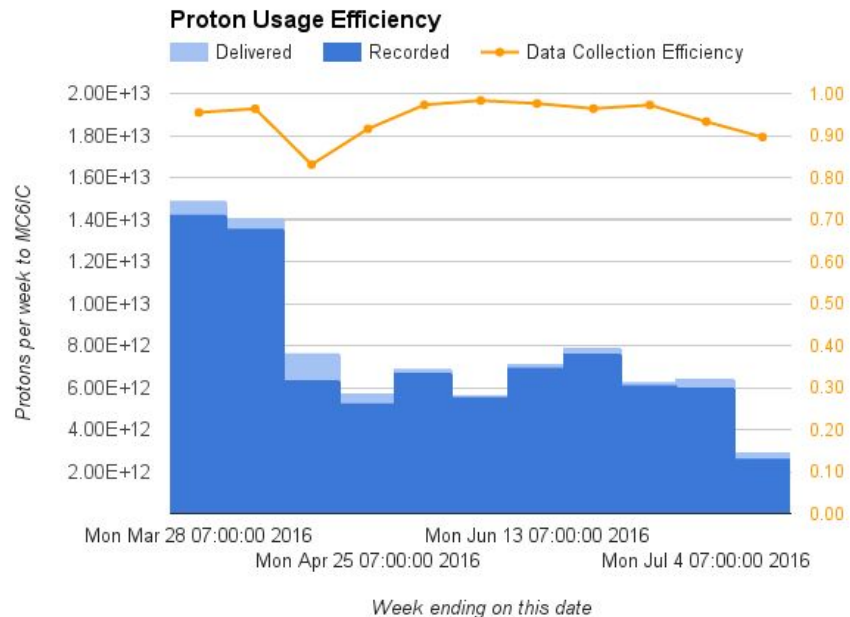


LArIAT
All Experimenters'
Meeting
2016.07.11

Jason St. John
U of Cincinnati

Proton Usage



Computing Usage

Average Jobs Running Concurrently [🔗](#)

110

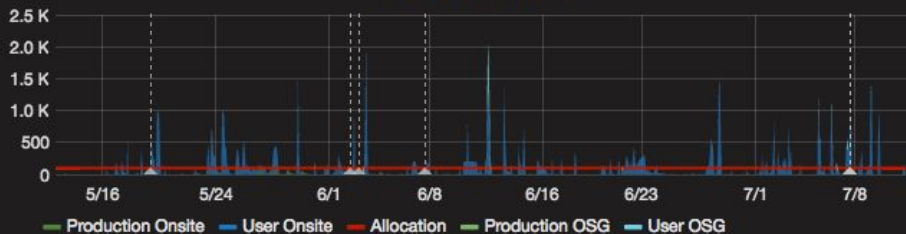
Total Jobs Run [🔗](#)

152588

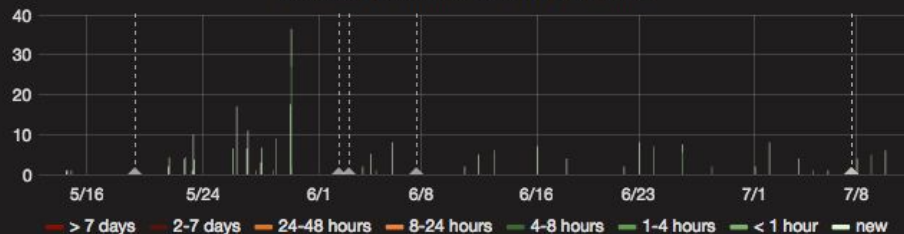
Average Time Spent Waiting in Queue (Production) [🔗](#)

2.468 hour

Running Batch Jobs



Queued Production Jobs by Wait Time



Total Jobs Failed (nonzero exit code)

45654

Average CPU Efficiency [🔗](#)

76.9%

Job Success Rate

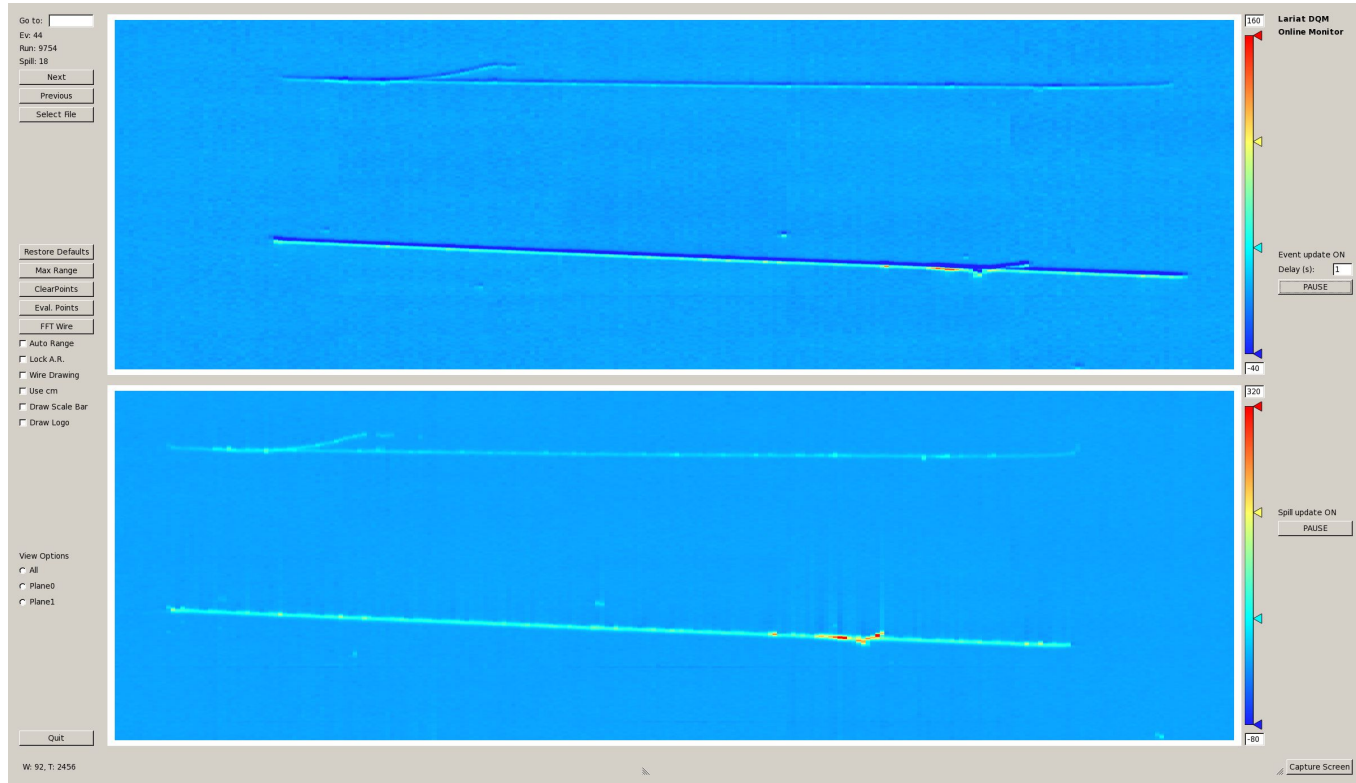


CPU Efficiency



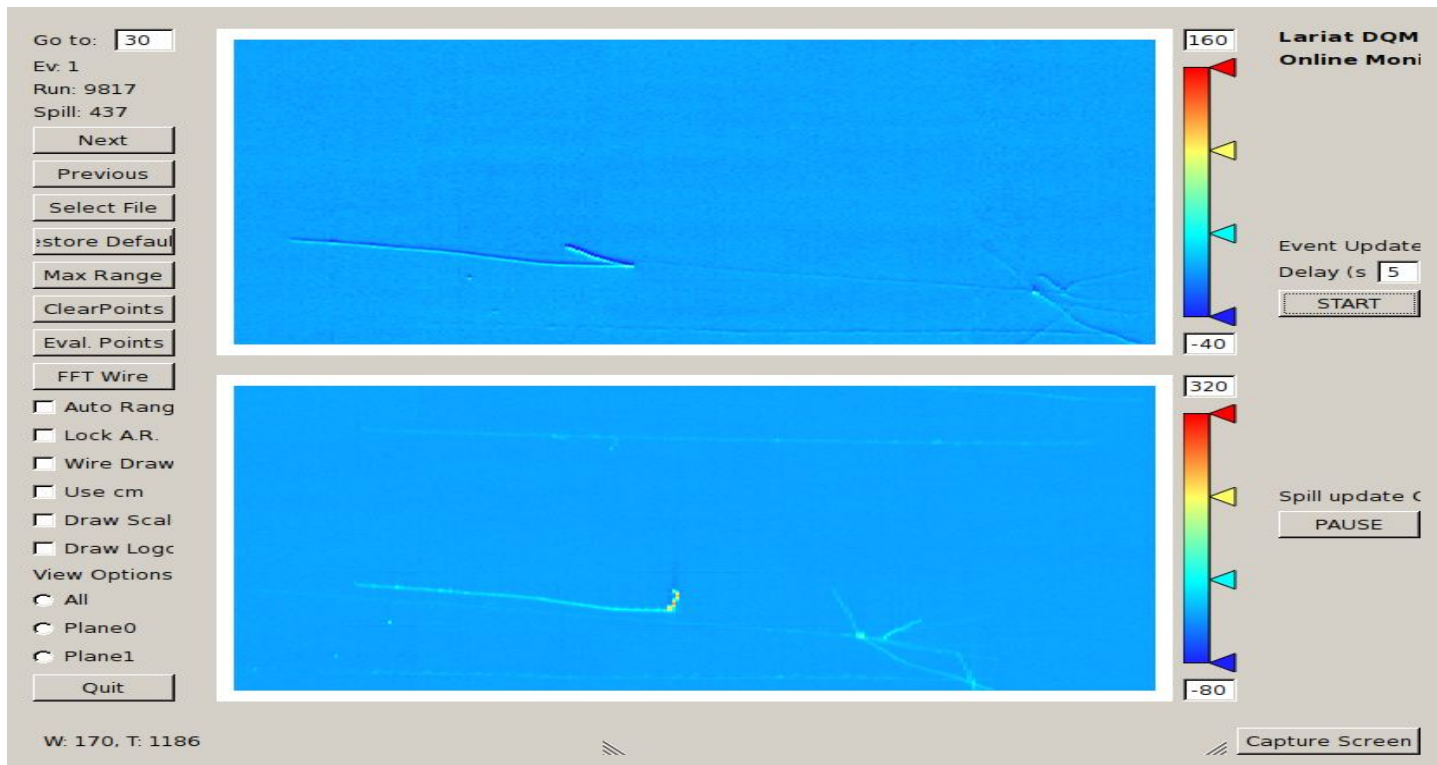
The LAr Purity

July began with questionable LAr purity: Some tracks attenuated, some robust



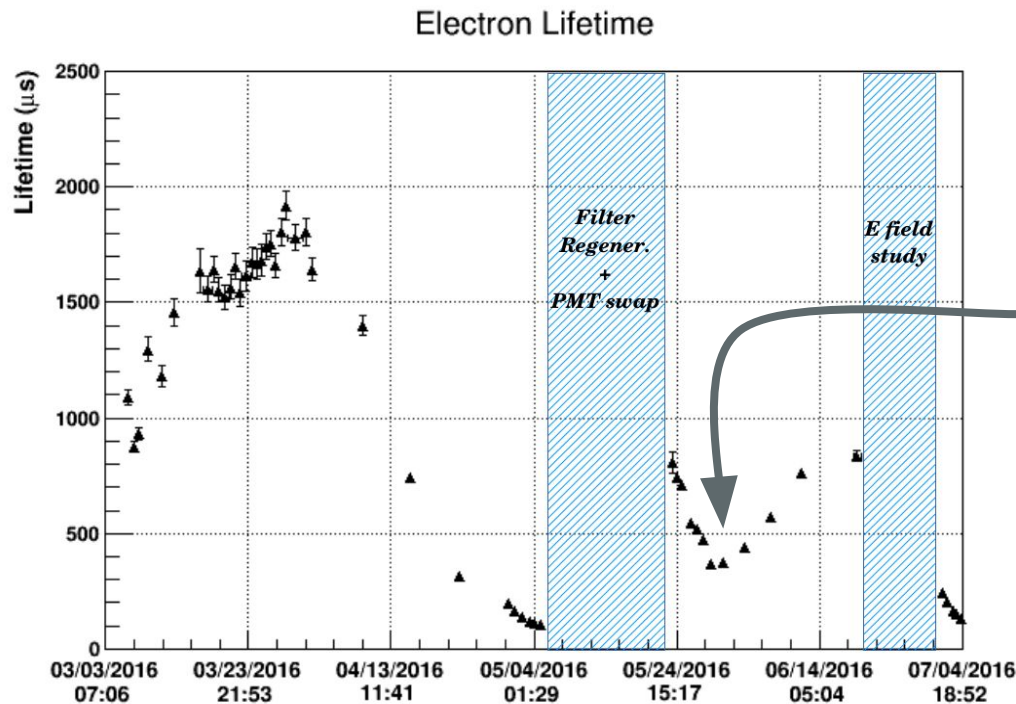
The LAr Purity

Within days, more and more tracks showed evidence of a worsening problem



The LAr Purity

We ran a purity estimation job for several key days. Lifetime recovered once, but can it do it again?



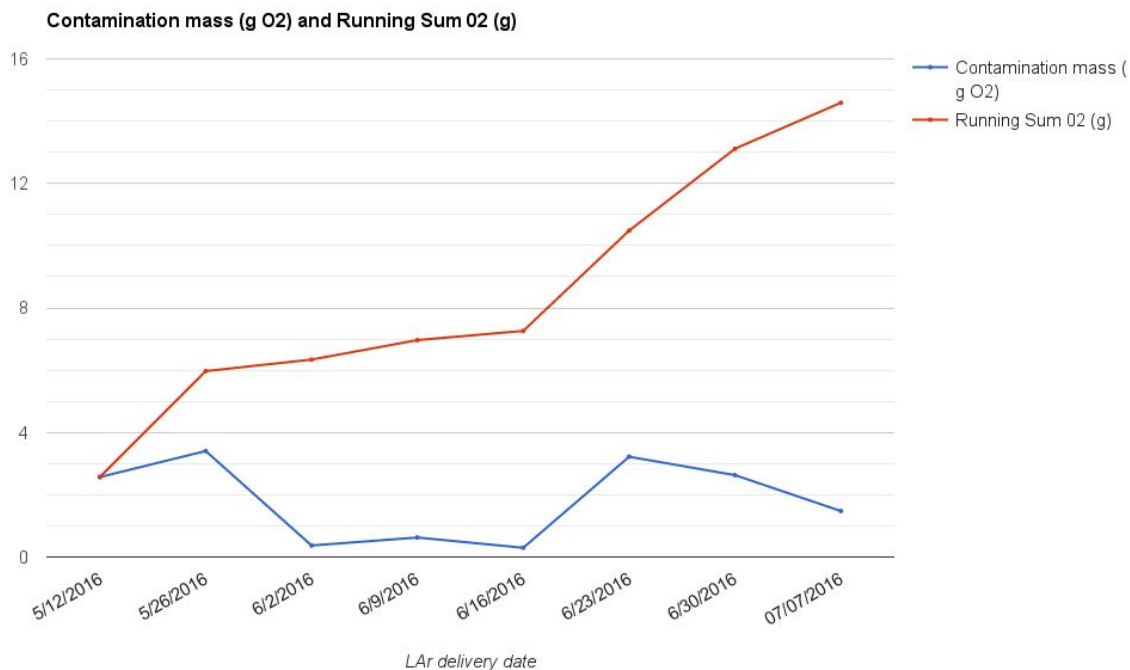
Lifetime wasn't too great even right after regeneration.

There is reason to suspect the dip was due to a LAr delivery with high O_2 concentration.

We are now headed even lower. Want to understand why.

The LAr Purity

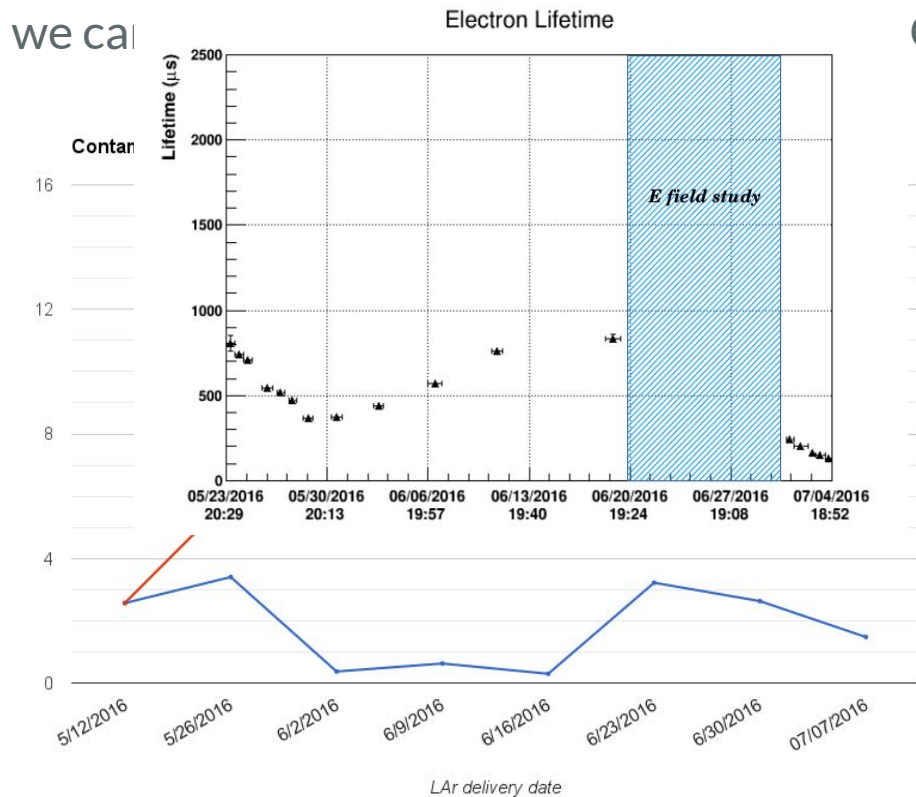
Using assays (for ppm O₂ estimates) and delivery tickets (for delivered quantity LAr) we can estimate a lower limit of how much O₂ the filter has been seeing



High-O₂ deliveries (~1 ppm) happened a few times.

The LAr Purity

Using assays (for nm O_2 estimates) and delivery tickets (for delivered quantity LAr) we can



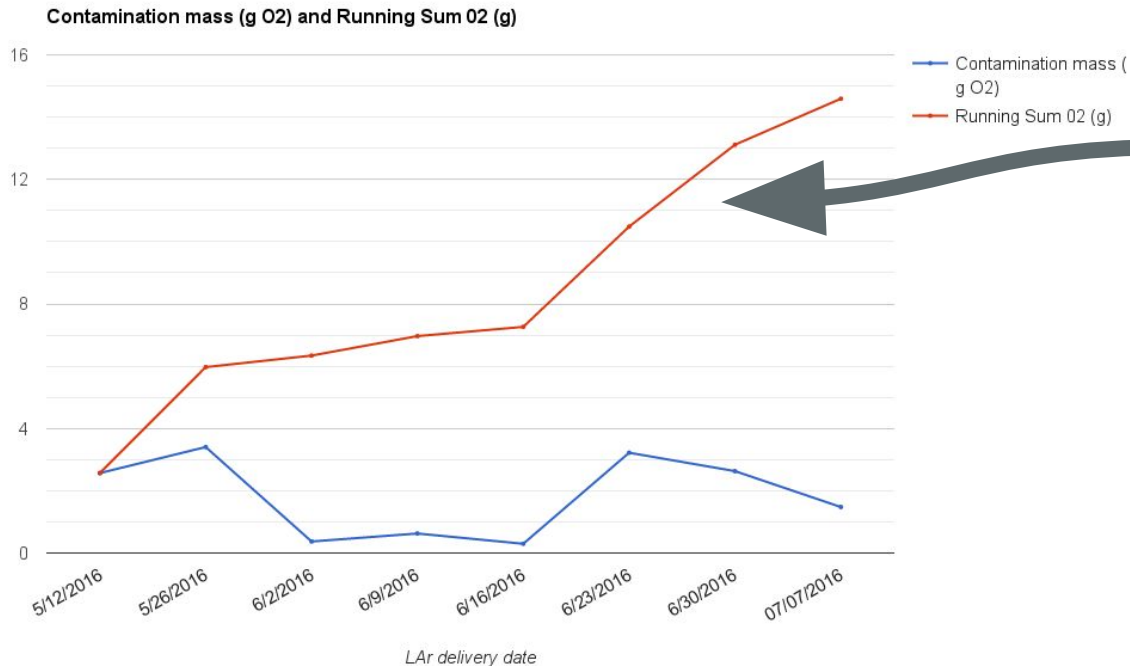
O_2 the filter has been seeing

High- O_2 deliveries (~ 1 ppm) precede declines in lifetime.

System was recovering... then during E-field studies, we hit it again with some funky LAr, unfortunately.

The LAr Purity

Using assays (for ppm O₂ estimates) and delivery tickets (for delivered quantity LAr) we can estimate a lower limit of how much O₂ the filter has been seeing



The estimated filter capacity is ~17 g O₂. Might be there in the next week, and things are already not good. So July 6 we decided to initiate regeneration proceedings.

The LAr Purity - The Plan now

Monitoring and prevention of further incidents:

- We had two O₂ gas analyzers monitoring the cryostat (liquid & ullage)
- July 6 moved one to monitor storage dewar ullage
- Fritz Schwartz & company working to borrow very sensitive model, to put downstream of filter. Cryo Controls group to help read them out.

July 7: Cut off flow to filter, begin emptying & warming for regeneration

- Shut off cathode, wires, cryoPMTs, wire chambers HV & gas.

July 8: Bring regeneration gas (Ar w/ H₂) tube trailer to MCenter

July 11 Monday: Heat filter and slowly introduce H₂, initiating rxn with adsorbed O₂.

July 12 Tuesday: Complete regeneration reaction if possible

When regenerated: Chill & fill.

Wednesday/Thursday Evening: Resume operations!