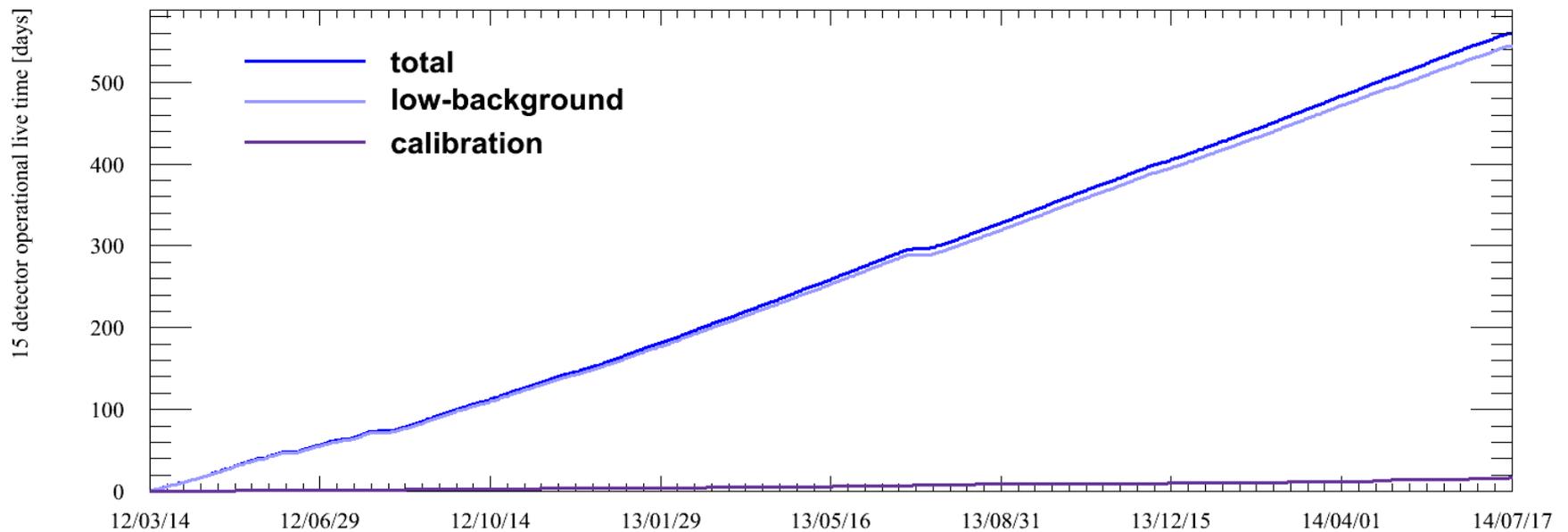
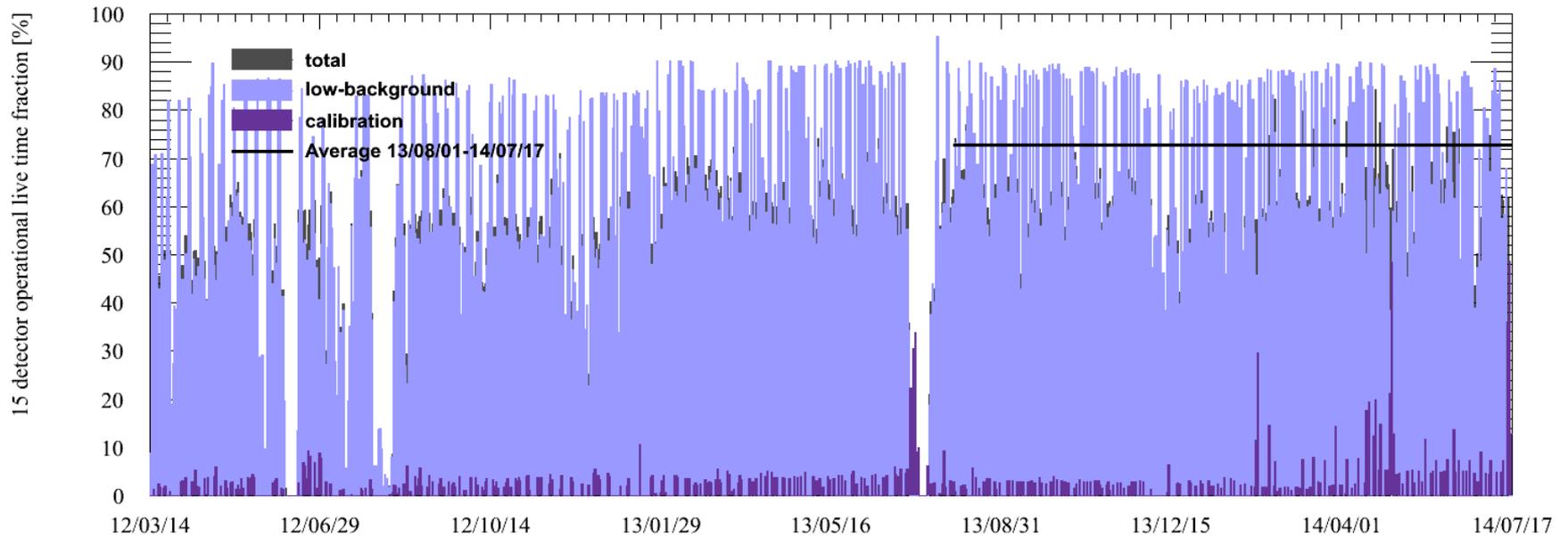


Cosmic Frontier Experiment Status

July 28, 2014

Experiment	Location	Status	Start of operations	Nominal end of operations	Physics
SuperCDMS	Soudan	Operating	Mar 2012	Mar 2015?	Dark Matter
COUPP/PICO 2L	SNOLAB	Operating	Dec 2013	Dec 2014?	Dark Matter
COUPP/PICO 60	SNOLAB	Operating	June 2013	Dec 2015?	Dark Matter
Darkside 50	LNGS (Gran Sasso)	Operating/ Calibrating	Jan 2014	Dec 2016?	Dark Matter
DAMIC	SNOLAB	Operating	Dec 2012	Dec 2014	Dark Matter
Dark Energy Survey	CTIO, Chile	Operating	Sep 2013	Feb 2018	Dark Energy
Pierre Auger	Argentina	Operating	2008	2015 (for FNAL)?	High Energy Cosmic Rays
Holometer	Meson Lab	Commissioning	Spring 2014	2015	Spacetime

SuperCDMS Soudan Data Set



SuperCDMS Soudan Operations Plan

- Warmup for maintenance (1 month)
 - ◊ Replace cold head on cryocooler
 - ◊ Service He pumps
- Studies over the next 6-12 months
 - ◊ Extended calibrations (detailed detector response)
 - ◊ Better understanding of backgrounds
 - ◊ Study electrical and vibrational noise sources and ways to reduce these
 - ◊ Determine reasons for failures of detector channels
 - ◊ New CDMSlite physics run with lower backgrounds and lower energy thresholds

COUPP/PICO Operations Summary

G2 not funded but positive reviews, R&D encouraged

- Main objective over next 6 months is to continue particulate sampling and understand particulate nucleation of bubbles
 - Water from both PICO-2L and COUPP60 extracted via filter in early July
 - Clear evidence for particulates in both, samples sent to PNNL for radioactivity and chemical analysis
- Setting up chambers at Fermilab and Queen's University to do particle spike tests

COUPP/PICO Operations Summary

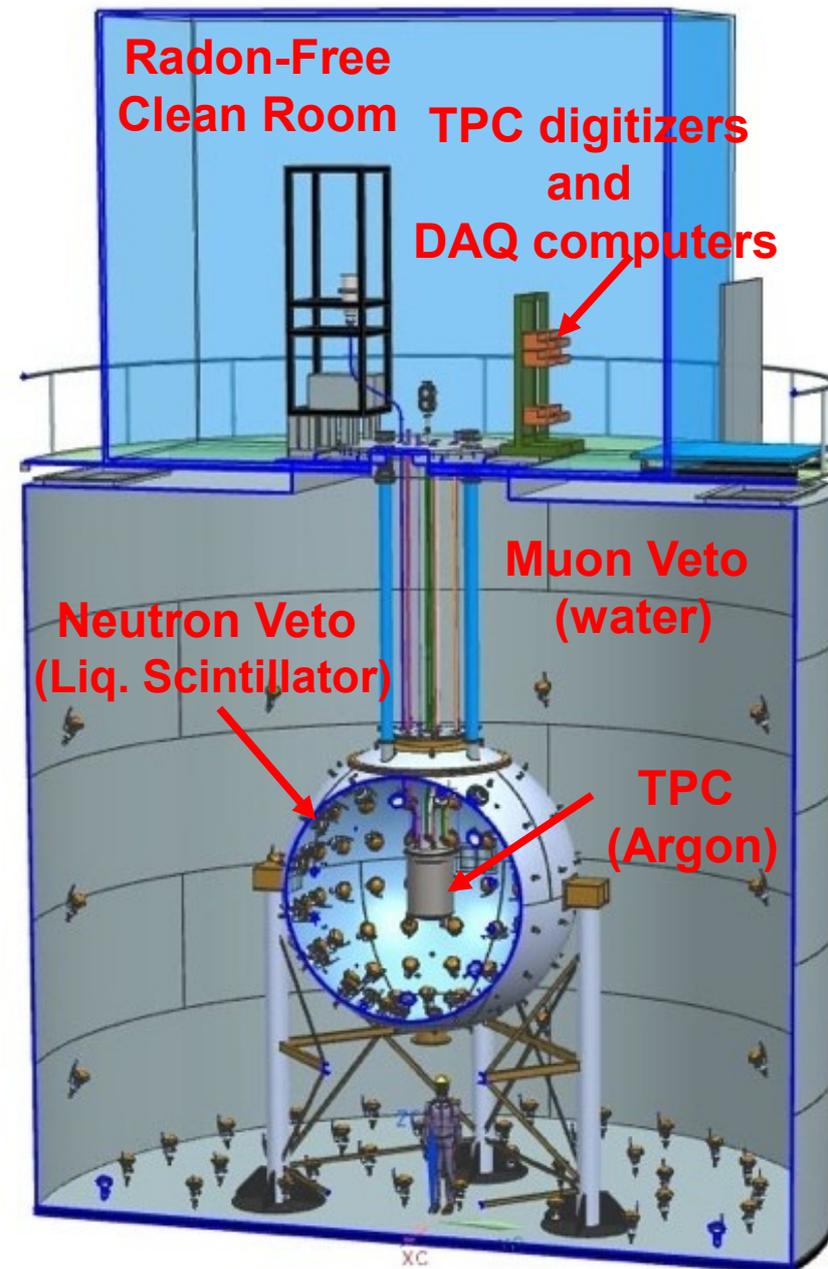
G2 not funded but positive reviews, R&D encouraged

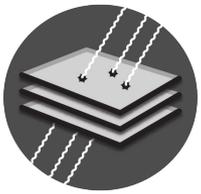
- In parallel, at SNOLAB preparing for a refill of PICO-2L with LAB liquid scintillator buffer instead of water
 - ◆ Test of new cleaning procedures (preliminary work necessary before a new jar is placed in service)
 - ◆ Engineering run to improve operational performance

DarkSide-50 Status



- **Main operation: TMB removal**
- **Neutron Veto** (TMB and PC mixture)
 - Observed a high ^{14}C rate due to TMB
 - Originally 50% of TMB
 - TMB removal and filling with new PC
 - Distillation plant:
 - Purification of new PC batch. **DONE**
 - Separation of old PC from the TMB:
Aiming towards 0.1% of TMB
Achieved 0.08% DONE
 - Complete procedure **FINISHED**
- **Modifying veto readout system to accommodate longer capture times**
- **TPC:** Used to monitor TMB removal





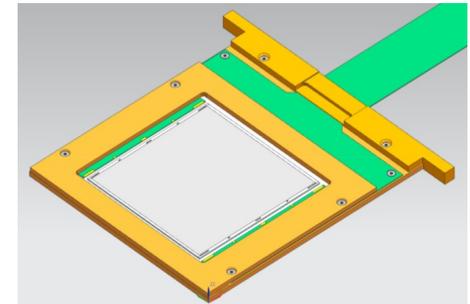
DAMIC - Dark Matter In CCDs

FNAL, UChicago, UMich, Mexico, Argentina, Paraguay, Zurich

June-July 2014

- Completed shield upgrade to eliminate 210Pb bkg
 - New inner shield made of ancient and new low radioactivity lead.
 - Installation completed at Snolab.
 - Currently analyzing the new data. It looks good, $\sim 10\times$ reduction in the observed bkg.

- DAMIC-100 detectors packaging
 - First batch already at Fermilab.
 - Flex circuit production completed: first batch at Fermilab.
 - Silicon substrate being diced at Kadco Ceramics.
 - Plan to start packaging the CCDs next week.



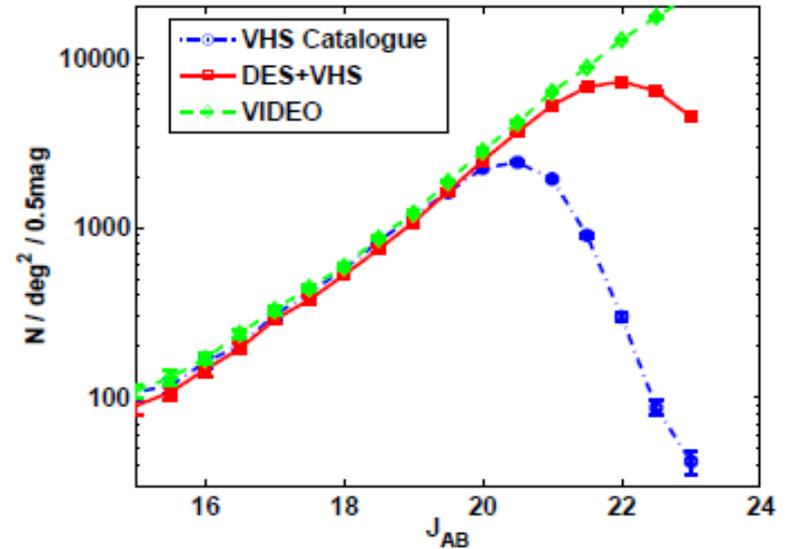
Status: taking data with prototype detectors. Uptime >95%. High quality data.



Dark Energy Survey

DARK ENERGY
SURVEY

- August 30, 2013 < Season 1 < February 10, 2014
- Now DECam is being used by other experiments/projects until DES restarts in August 15, 2014.
- We have the new observing schedule from CTIO
- Meanwhile, DES is
 - Working on completion of science publications. 3 submitted. See 3rd one to right. one accepted so far. Several more “in the works”
 - Y1A1 processing started continues
 - Preparing for Y2 observations and processing on FermiGrid



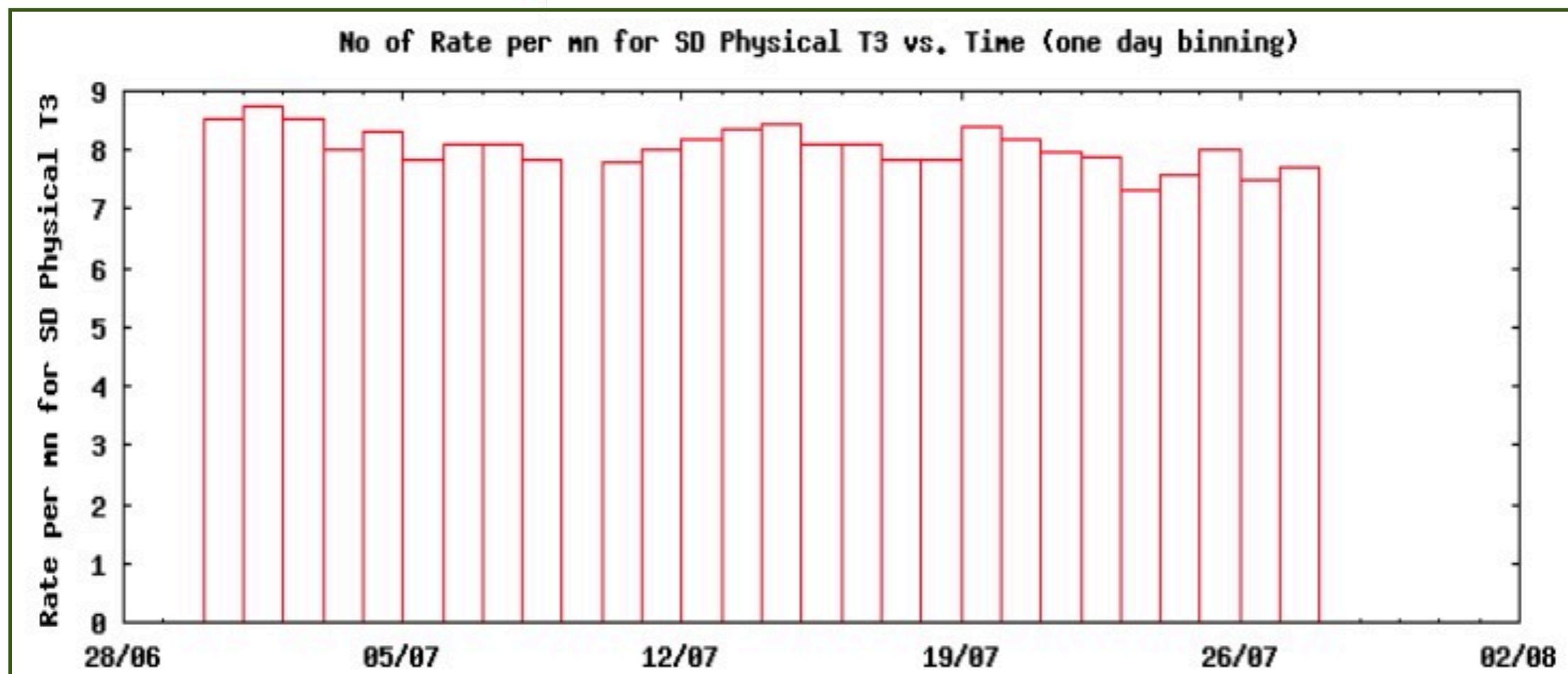
Banerji, M., et al., “Joint Optical and Near Infrared Photometry from the Dark Energy Survey and the VISTA Hemisphere Survey”, arXiv:1407.3801.

Pierre Auger Observatory

Activities between June 30 - July 27

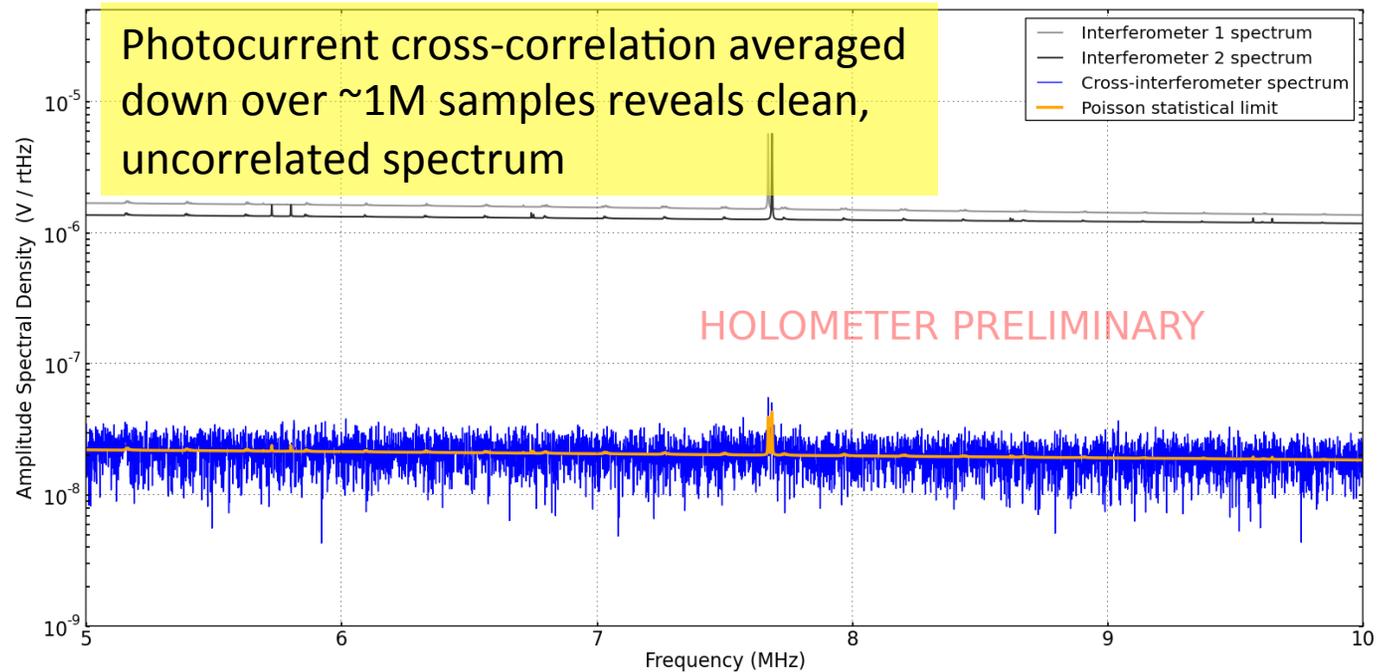
- SD efficiency: 98.3% efficiency in the past five weeks, on-going maintenance, upgrade R&D activity (involves SD) continuing in the field, very stable.
 - number of black tanks < 22
- Recent FD observation period:
 - June 17 - July 7; smooth, periodic high wind (>50km/h) on July 4, rain on June 25
 - July 17 - Aug 5; smooth, rain on July 23, 26
- Radio array (AERA) is running stable, part of overall monitoring system

❖ June 30 - July 27: Number of triggers from cosmic rays ($E > 10^{18}$ eV) per minute ~ 12000 / day



Holometer (E-990) Operations Status:

Real,
out-of-signal-
band data at
near
holographic
noise
sensitivity



- **Beginning 1-year operations phase July, 2014**
 - Interferometers running stably and high quality data being taken at near full power
 - Uncorrelated shot noise is integrating away nicely
- **Operations phase tasks**
 - Develop in situ signal calibration schemes
 - Investigate and mitigate any sources of MHz frequency noise which may be uncovered by increased sensitivity levels
- **Seismic/acoustic stability is still an issue**
 - One of the interferometers still leaks 30% more power than the detectors can handle.
 - Investigating electronic and mechanical fixes (alignment control, tethering hut down)