2020/09/15

Status of the gamma cross verification

Chris Jillings
Research Scientist

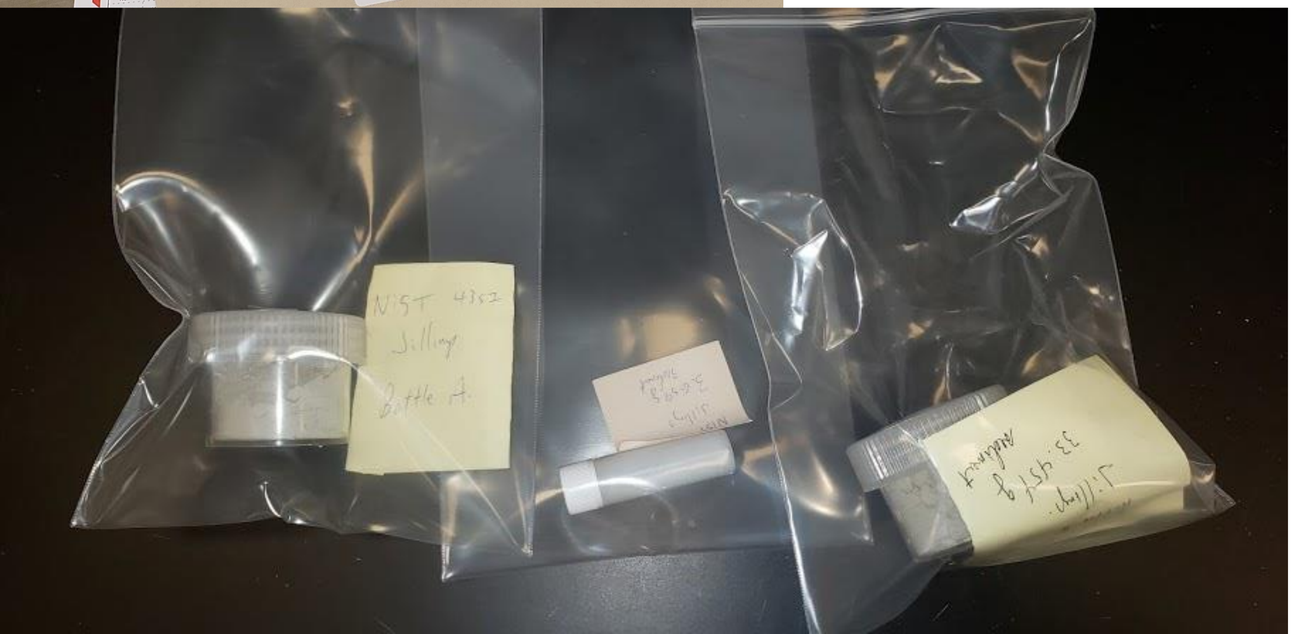
We want to assess how well labs can measure gamma activity in materials and have a meaningful cross comparison

There are some fundamental differences in how calibrations are performed and backgrounds subtracted.

At a meeting at Gran Sasso, we decided to make samples that could distributed and tested.

Two sets of samples exist.

The labs reserve the right to keep their results private. We do not distribute beyond the DS Materials Working Group and the participating labs without permission.



Two sets of samples were made

One sample is a set of three radioactive salts dissolved in mild acid. Distributing this has been logistically troublesome. Despite proper acid procedures, FedEx has refused to ship

One set is powdered ocean sediment from NIST divided into two small sample jars and well detector sample.

As far as Canada is concerned the ocean sediment sample is simply a sample for testing and can be mailed without restriction.

Current Status

SNOLAB has measured all samples

- Dissolved sample on the “PGT” detector
- Ocean sediment on all GE detectors

Canfranc

- Iulian Bandac has confirmed receipt of sediment pot B and will start measurements on time scale of ~1 week

Temple

- Sample pot A is in the radiation safety office at Temple. Jeff Martoff had extra paperwork to do because the sample is NIST certified.

LNGS

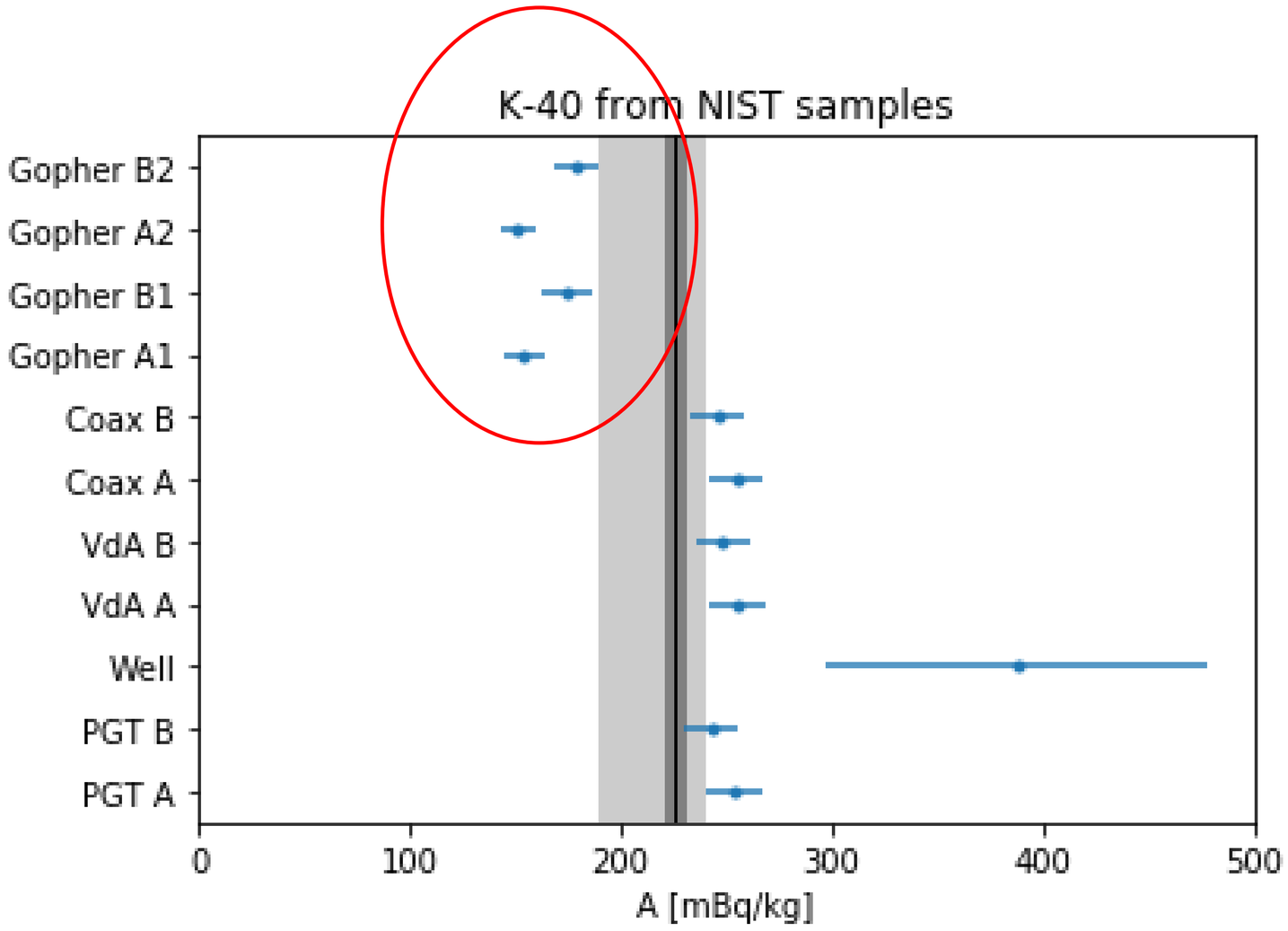
- Will get sample pot B directly from Iulian.

Boulby

- Was contacted this week. If they participate, I will send the well detector sample as appropriate and pot A.

Sample Data from SNOLAB

Recalibration of the gopher detector not yet complete



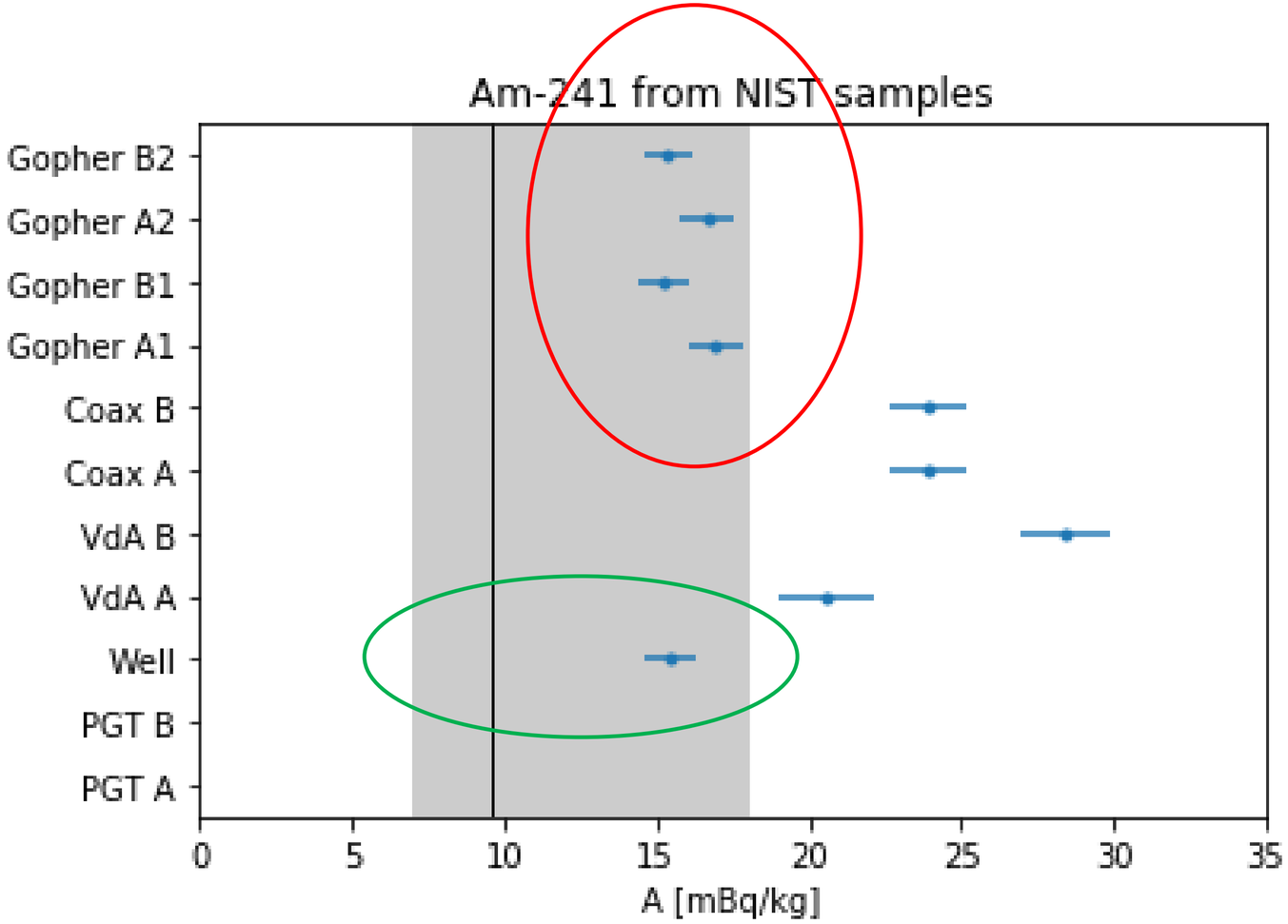
SNOLAB treated, at my request, this sample just like any other.

Did by chance pot A get slightly hotter than pot B?

SNOLAB detectors in excellent agreement with each other. But of course they are – the technique is the same.

Sample Data from SNOLAB

Recalibration of the gopher detector not yet complete



SNOLAB treated, at my request, this sample just like any other.

The well detector does nicely for Am-241.

Analysis Status

SNOLAB has analyzed U-238 chain, Th-232, …

About 8 radionuclides done

Will Bateman-Hemphill is compiling results and making summary plots.

Up next: the limits.

As data come in – Will will add the work to his plots.

Final Notes

This has taken too long and logistics from March through now have been tough.

But this task finally has proper traction and the human resources to get real progress made.

Priors (ie counting)

Posteriors (DEAP analysis and counting)