Radiogenic Breakout Session

Thursday 3:30pm

Community Assays Database

End of the year 2014: code finalized

Maintenance of the code and fixing small bugs: James

Corrections&co. (future): Ian (SNOLAB)

1 person in charge to enter data

legacy data: not all historical data, new LUX and DarkSide

Still working out small details (exporting, .. ) but database project is ~ finished (+Paper)

Facilities, Access and Needs

Next proposal: website/portal tools which lists available assay techniques, facilities, features sensitivities and queue

more international?

Who: PNNL and USD

New Detector Development

From beta-cage experience, might be easier to build a screener as a consortium

Screeners for G3 beyond current capabilities - hard to get it

BACKGROUND REDUCTION

Radon Abatement

List of references on the low rad wiki http://zzz.physics.umn.edu/lowrad/meeting7/breakouttopics

Rn plate-out studies in different environment conditions

Rn diffusion ?

Radon reduction systems individual by experiments

Cleaning and Handling

List of available cleaning techniques and procedures w/results - to be included in the facilities website?

—> Hosting a workshop to come up with a list of …see above

(timeline: ~1,5 year to get written standard procedures)

Community/budget TBD before proposal (summer 2014)

Who: USD and PNNL

national labs versus universities to be considered for proposal

Purification Techniques

Difficult to measure it, how to the ppt level?

R&D program at USD for noble gases - can it be a part of the proposal?

LZ/XENON &co. need to have their own program

Neutron Veto R&D program

—> Workshop?

Other Ideas for Consortium:

Email highlights (Maury Goodman, style).

AARM Radiogenic Backgrounds Breakout Session – 21March2014 Afternoon

SOURCES4 and USD

* What issues still need to be resolved?
  + What value does the proprietary SOURCES4 code add? Should we write our own code that performs these calculations?
    - How much effort would a publishable code take? We should realistically budget the effort required.
      * 2 years of a full-time postdoc? More than one post-doc?
      * Validation testing
      * Updating and improving the cross-sections
      * Could **start with USD** or start from scratch
      * Can we use Vitaly’s EMPIRE libraries?
      * Interested parties: Alan Robinson, USD team, maybe SMU
    - Would be nice to have something about this at LRT next year.
    - Would the Geant4 team be interested in implementing this with our help?
      * Sounds like the Geant4 team may be working on this.
  + The difference between homogeneous mixtures and material boundaries should be explored.
* Should we create a SOURCES4 spectra database?
  + This would be a database with neutron emission spectra for certain materials.
  + Hang showed a mock database.
  + This database would not do new calculations, just show the results of previous calculations.
  + Would be good to add which library was used.

Calculations

* Should we share HPGe analysis software?
  + Simulations
    - Could standardize Geant4 version
    - Standardize physics lists
    - Generators?
    - Probably can’t standardize geometries (detector dependent)
  + Analysis
    - Could fall upon the workshop discussed on Thursday.

Joint Discussion with the Simulations Group

* Discussion of a new alpha-n code continues. Start with a focus on Geant4.
  + Some questions about the ability to reasonably calculate a low probability effect in the Geant4 framework.
* Nuclear cross-sections
  + Alpha-n cross-sections aren’t well known for some materials, i.e. copper, argon, germanium, chlorine.
    - There is a community that makes these measurements.
    - We should make connections with this community to explain our needs. Alan Robinson and Anthony know relevant people.
  + Low energy elastic scattering calibrations, ie energy scales and detector response.
  + Angular correlations in the neutrons from spontaneous fission?
  + Neutron capture in materials?
    - <https://www-nds.iaea.org/pgaa/pgaa7/index.html>