New Dark Matter Depth Task Force
formed to study the
Impact of depth on dark matter technologies, shielding, and sensitivity
Subsidized by AARM NSF S4 and INPAC (University of CA)

Dovetails with AARM goals, but targeted at a White Paper by August

A Collaboration emerging from the Dark Matter Writing Group

Minnesota: Cushman, Reisetter, Villano, Pepin, Roth
Brown: Gaitskell, Pangilinan, Malling
LANL: Hime, Hennings-Yeomans

USD: Mei, Zhang   Caltech: Golwala
Davis: Tripathi   Berkeley: Sadoulet
LLNL: Bernstein, Sweany   UALR: Empl

We have targeted cosmogenic simulation as the key
Differences between predictions can be due to
* *poorly-understood physics processes (e.g. μ-induced neutrons)*
* *effects of secondary particles & multiplicities under differing implementations*
* *validity of muon and neutron parameterizations, differing interpretations*
        And… in the end… how do you compare to data?

Progress

Minutes and tasks can be found in the Depth Wiki
http://zzz.physics.umn.edu/lowrad/dm_task_force

Program

* Establish a common GEANT4 version and physics list *(Minnesota, Brown, USD)*
* Establish FLUKA at 2nd site *(LANL, UALR➔ Houston)*
* Validate all simulations with a simplified geometry *(LZ water shield)*
* Create new Homestake Sim with secondaries and MUSUN muons (USD)

   Compare to parameterized muons, no secondaries, old Geant4 physics

* Veto efficiencies and Gen2 and Gen 3 exposure requirements

   Compare germanium to noble liquid strategies

* Compare to data

   Geant4 vs Neutron Multiplicity Meter @ Soudan

   Fluka vs Borexino

* Feedback to *Geant4 collaboration (thru SLAC Geant4 Collab)*

   Fluka (through A.Empl, Darkside/Borexino)