Mark Duvall

Progress Update, 2/25/'16

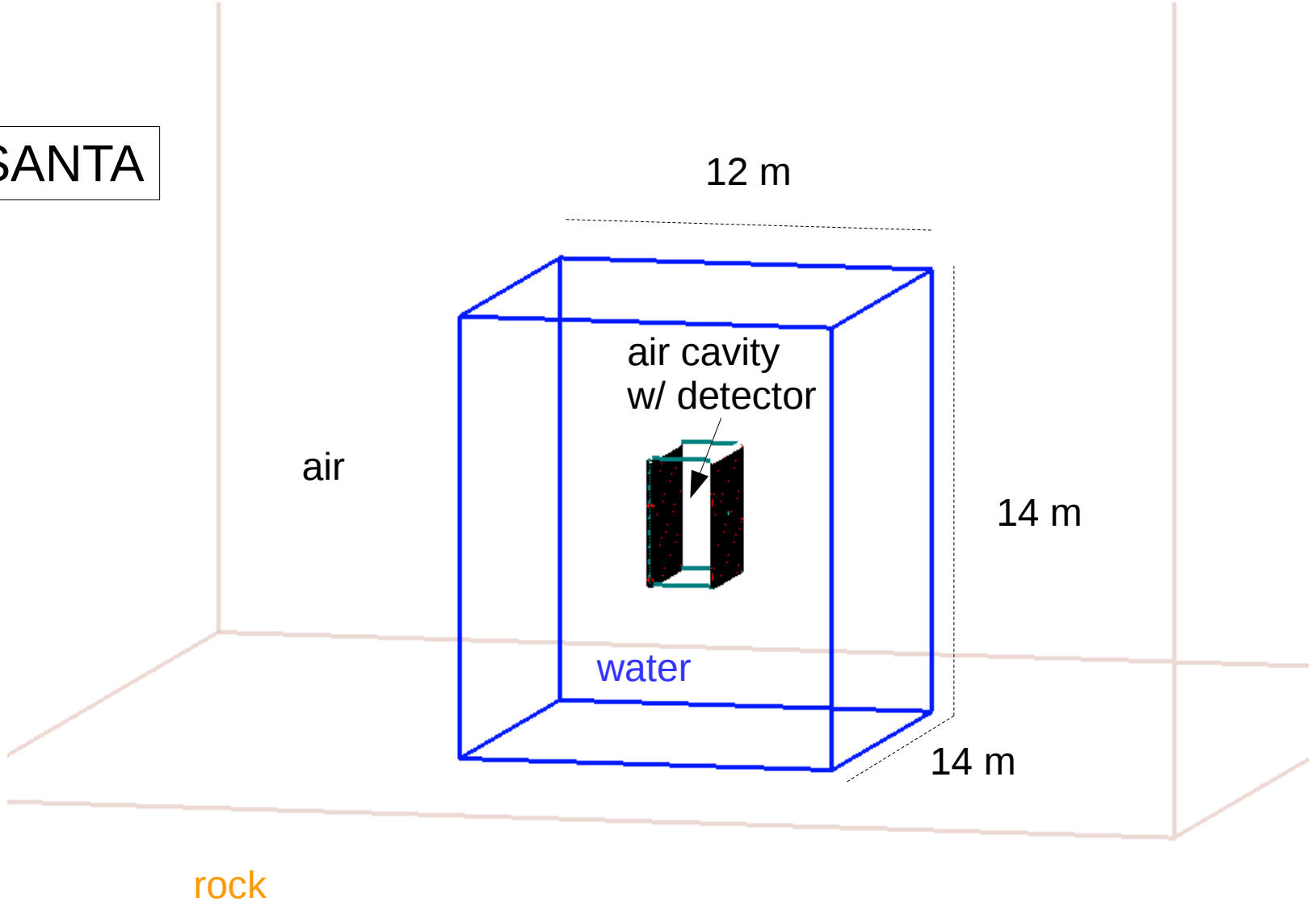
- Items:
  - Report – latex references debugged
  - Misc.: RAT-PAC @ UH
  - MAIN: New Sims
    - New geometries defined
    - Neutron backgrounds
    - Parameters list

Progress Update, 2/25/'16

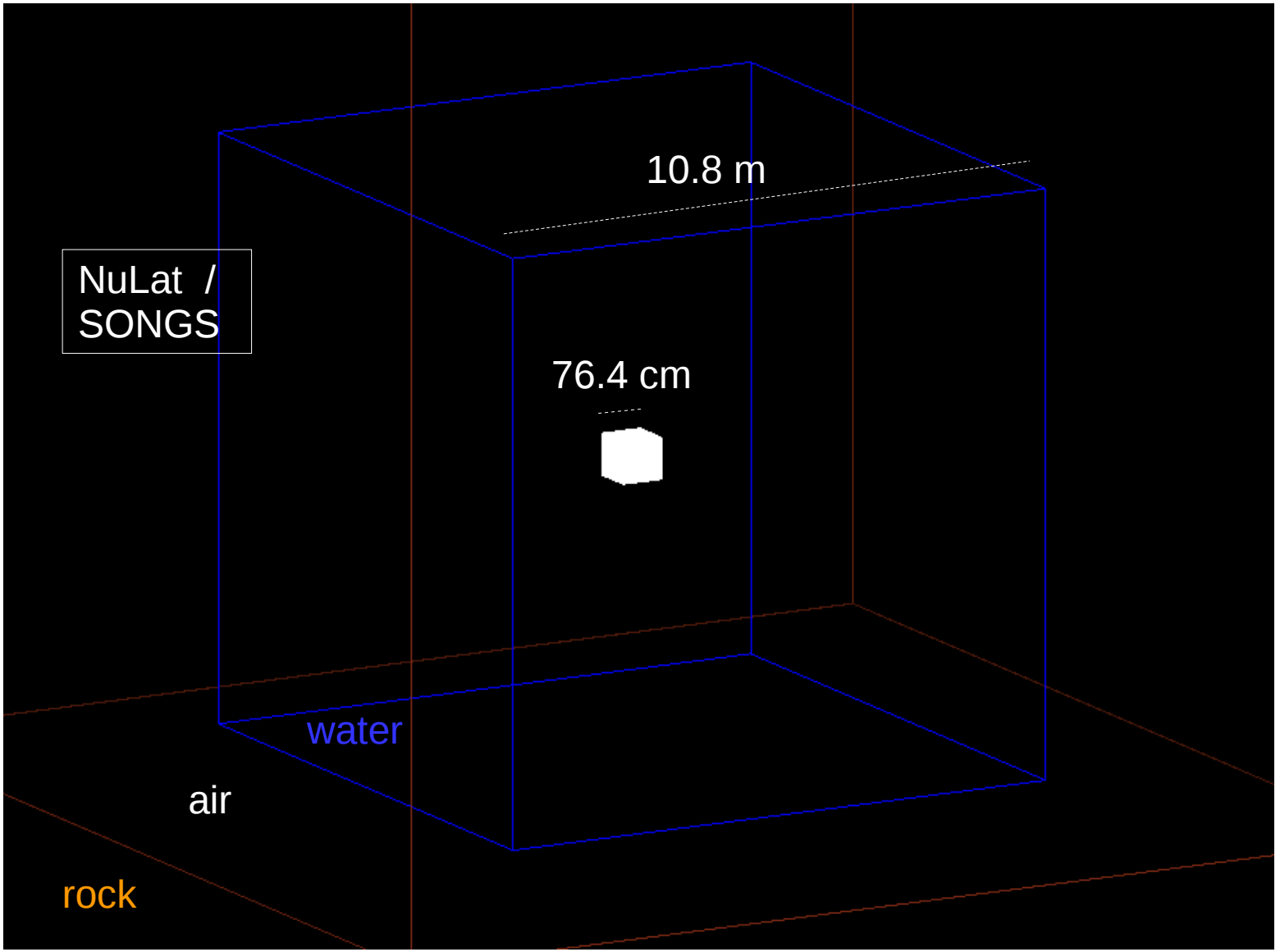
- New / Updated Geometries:
  - SANTA: shield added
  - NuLat: now 15x15x15, and shield added
  - “SONGS”: created w/ shield
- Shield geometry OK? (next slides)

Progress Update, 2/25/'16

SANTA

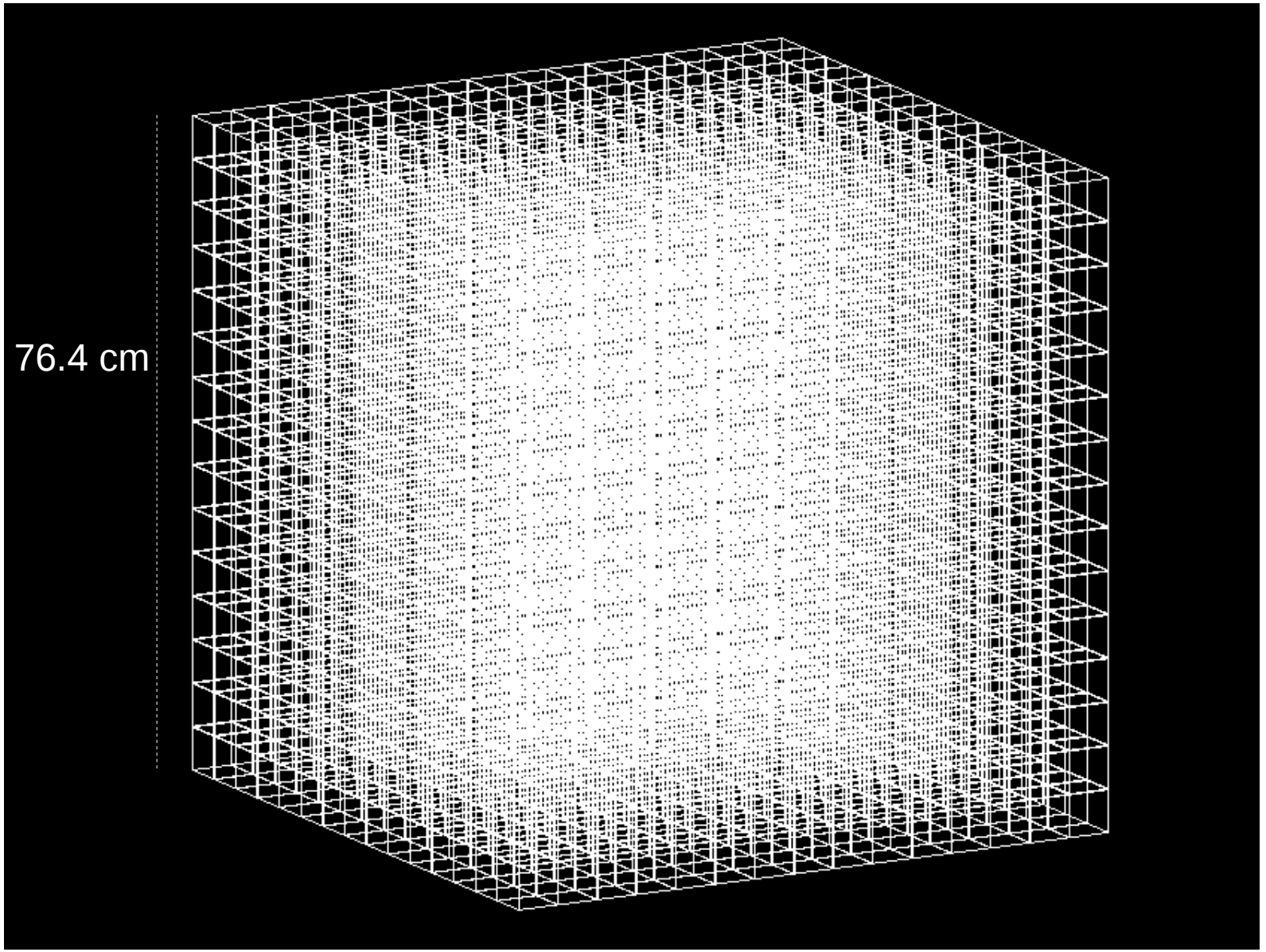


Progress Update, 2/25/'16



Progress Update, 2/25/'16

NuLat, 15^3

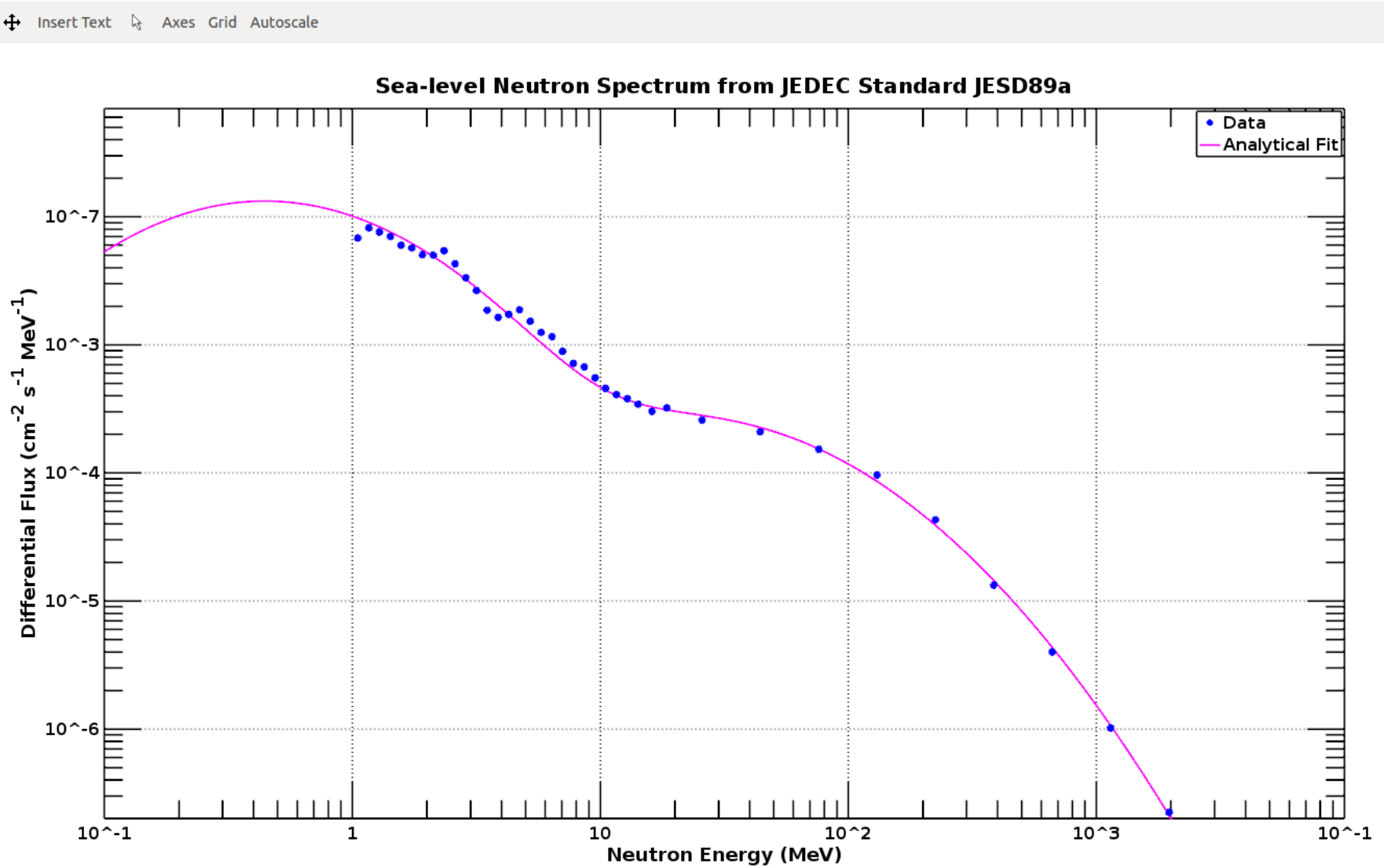


Progress Update, 2/25/'16

- Neutron Backgrounds:
  - Distribution → MATLAB → *Parser → RAT-PAC
  - Distribution: curve fit from JEDEC standard JESD89a for fast neutrons @ sea level (see next slide)
  - Current status: writing MATLAB parser
  - Isotropic: uniform sphere around detectors OK?

Mark Duvall

Progress Update, 2/25/'16



Progress Update, 2/25/'16

- Parameter List
  - Scintillators & dopants: kept as before
    - SANTA: EJ-254 @ 1%wt B-10 (5%wt natural B)
    - NuLat: EJ-254 @ 1.5%wt Li-6
    - SONGS: we didn't discuss this; I've found in papers that it was Gd-doped liquid scintillator but could use some more detail (can easily use Double CHOOZ material)
  - Configurations
    - SANTA: same as before (2mx2m planes, thickness 0.5 & 6 cm)
    - NuLat: increased from 3x3x3 to 15x15x15 (cells are still 5-cm cubes w/ 1-mm spacing)
    - SONGS: single cube, scaled to (15^3) NuLat size

Progress Update, 2/25/'16

- Shielding
  - 5m of H20 surrounding each detector on all sides
  - SANTA gets two runs: shielding on & shielding off -- this was our conclusion, yes?
  - we didn't explicitly discuss shape; all 3 detectors are right rectangular prisms, so I'm planning to fit 5m-thick water "boxes" around each of them unless anyone wants otherwise (spheres?)

Progress Update, 2/25/'16

- Backgrounds (for now, fast neutrons only)
  - Spectrum: fast neutrons at sea level
    - as in JEDEC standard JESD89a
    - not adjusting for 20mwe depth, correct?
  - Distribution
    - Spatial: uniform around the detectors
    - Directional: isotropic
    - Temporal: we didn't discuss; I'm planning to use RAT-PAC's built-in Poisson distribution
- AOB?