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Title: 6Li based Neutron Detector Systems for Replacing 3He

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6Li based Neutron Detector Systems for Replacing 3He

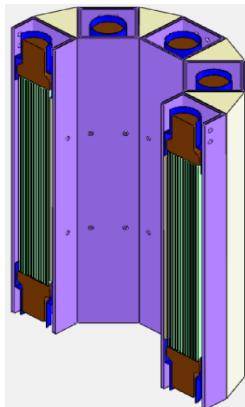
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Prior Results

- Conceptual design of single detection module and coincidence counter
- Characterization of PSD properties of new plastic scintillator
- Fabrication of detection module in progress
- Electronics platform selected. Signal processing in progress

Concept



Neutron Coincidence Counter

- Based on ⁶Li neutron sandwich scintillator
- Similar efficiency to HLNCC-II coincidence counter
- Similar die-away time
- Better dead time

Technical Challenges

- Reactivity of LI metal
- Neutron/gamma discrimination
- Light transport of PMMA sandwich
- PSD in thin scintillator films
- Fabrication of PSD scintillation film

Planned Accomplishments

FY 13

- Fabrication of detection modules.
- Readout electronics.
- Characterization of first prototype with Pu material

FY 14

- Characterization of neutron detection modules
- Fabrication and characterization of subassembly prototype neutron coincidence counter
- Scale-up modeling of full size counter