“Uncontroversial” design topics

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- We have the heritage of designs from the two leading WIMP search experiments
- In detail, many or most design decisions, were different. How to choose? XnT, LZ, or something new?
- This talk based on a WG 3/4 planning document, which includes a list of design decisions. This is not intended as a fixed, authoritative list.
- I've been impressed by the open-mindedness with which people have approached the design of XLZD.
- Included in this list is my subjective assessment of whether we have some level of consensus.
- The purpose of the next slides are to get the juices flowing for our breakout discussions.

Likely easy major decisions

What	Concensus?	MC study	E&M, fluid sims, etc.	Lab tests	Design study	Either XnT or LZ?
Weir, not bell jar	y					
Kr removal by distillation	y					
Instrumented skin	m	x				
Liquid phase purification	y					
Liquid tight TPC as radon mitigation	y					x
Gas phase purification as well	y					
Titanium over SS vessel. But now Ni?	m	x			x	
Cathode HV feedthrough geometry	n				x	
Some level of serviceability/access	y				x	
Cryogenic Xe recovery	y					

Major decisions

What	Concensus?	MC study	E&M, fluid sims, etc.	Lab tests	Design study	Either XnT or LZ?
Online Rn removal? What turnover time?	y?				y	
Grids - woven wires, single wires, electro-etched?	m		x	x		
Induction grids for ßß decay SS vs MS	n	x	x	x		x
Ni vessel, other material changes for ßß decay (or other physics)	n	x	x	?	x	x
More radical changes for ßß decay?	n	x	x	x	x	x
Outer detector design, driven(?) by ßß decay	n	x	x	x	x	
Geometry of OD, staging of TPC for servicability	m			?	x	
Field cage resistors - custom low background? conductive plastic? what level of testing?	y?					
PMT choice - 3", 2" ... SiPMs instead?	n	x	x	x	x	x
PMT array mechanics	n	x	x	x	x	x
LXe flow deign, cryostat temperature control	y?		x	?	x	

Major decisions, cont'd

What	Concensus?	MC study	E&M, fluid sims, etc.	Lab tests	Design study	Either XnT or LZ?
Cold PMT readout electronics?	n?	x	x	x	x	N
Cold HV distribution/multiplexing	n?	x	x	x	x	N
TPC mechanics and servicability - exoskeleton?	m			?	x	
Field cage design: PTFE thickness, ring configuration	n	x	x	?		
Reverse field region - field grading or not?	n		x	x	x	
UG testing - 1.5 m scale grids (and other?)	n	x				
UG testing small scale: 15 cm grids, HV delivery, PMT light emission, resistor light emission	n	x				
Tritium calibration with liquid phase purification	n		x	x		N
Tritium background mitigation						
Top, bottom PMT shields- grids, or integrated with arrays	m				x	
Reducing IV bottom dome volume						