Version 7.6 - 10/6/2010

doc 2843

Input value	
Calculated	

Quality	Meaning
***	Stable, well understood parameter
**	Reasonably well defined parameter
*	Rough estimate

Parameter	Value	Units	Quality	Req ID	Notes
Anode Plane Assembly (APA)					
Wire spacing - X plane	3	mm	***	FR.Det.LAr TPC.W5P	Should be <5 mm for good tracking resolution and e-pi0 separation. Doc #266
Wire spacing - U,V plane	3.3	mm	***	FR.Det.LAr TPC.3Planes	Should be similar to X plane. Exact size chosen to have an integral number of readout cards on an APA
Wire plane gap	3	mm	***		Should be ~same as the wire spacing
Wire angle	45	deg	***	FR.Det.LAr TPC.Orient	Optimized for beam neutrino interactions. Doc #2836
APA length	2.52	m	***	FR.Det.LAr ConstCost	Should be ~2.5m for std truck transport. Size chosen to have integral number of readout cards.
Num grid wires	1680				Grid wires have same orientation as the X plane
Num U wires	1080				Convert formula result to integer
Num V wires	1080				
Num X wires	1680				
Wire diameter & composition	150	micron			Copper-beryllium. Standard chamber wire
Wire tension	1	??		FR.Det.LAr TPC.WireSag	
APA num readout wires	3840				Convert formula result to integer
Num readout channels	2				Divide by MUX level & redundancy factor
APA total num wires	5520				
Drift distance	2.47	m	***	FR.Det.LAr TPC.MIPSN	Any value near 2.5m is OK. Set to give 2.5m cell incl APA thickness
Wire wrap length	2.52	m			
Num wire wraps	2.78				
APA height	7.0	m	***	FR.Det.LAr Cryo.CST.STD	Chosen for ease of transport and cryostat depth. This is the active height, not the total height
APA thickness	7	cm	***		2" thick SS frame + 3 wire planes on both sides
APA weight	258	kg	***		Includes frame, printed circuit boards, readout boards, covers
Cathode plane weight	100	kg	***		
U,V Wire length	9.9	m			
Wire capacitance (in air)	15	pF/m	***		H. Jostlein measurement of prototype
U,V wire capacitance (in LAr)	238	pF			Apply dielectric constant for LAr
APA Cell Volume	87	m^3			Each cell has one APA in the middle
Argon Density	1.383	gm/cm^3	***		
APA Cell Active Mass	0.12	kton			Change density from 1.4 to 1.383. Remove APA dead space.
APA Transverse Fiducial cut	0.3	m	*	FR.Phy.LAr Osc	Approx value for neutrino oscillation physics. Basis - MicroBooNE and ArgoNeuT studies
APA Fiducial Volume	73	m^3			Transverse fid cut on both sides of APA + one cut at the top/bottom)
APA Fiducial Fraction	84%				
APA Fiducial Mass	0.10	kton			