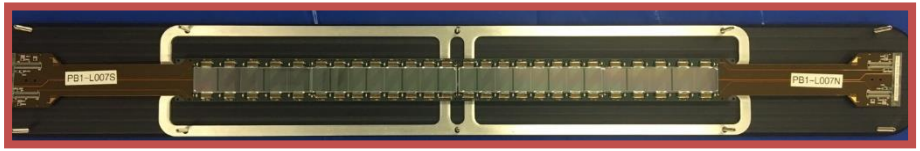
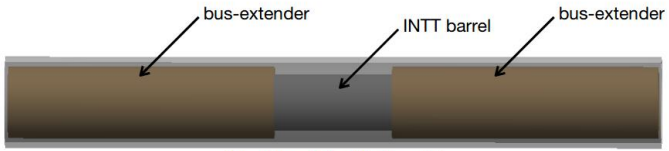
INTT Tasks and Manpower

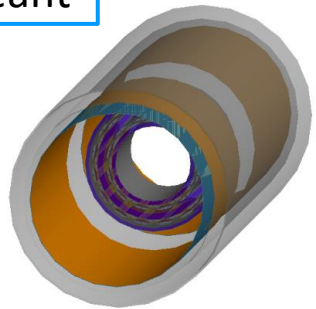
April19th, 2022

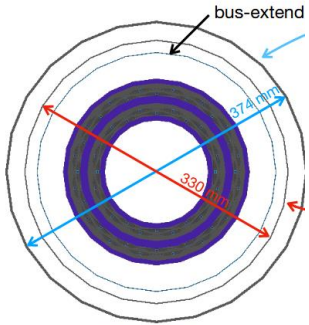




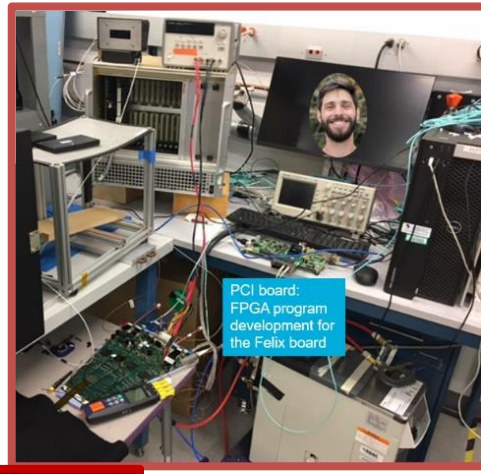
Side view of the INTT model

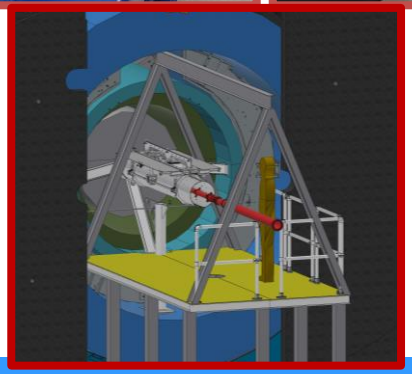
Geant





Cross-section





INTT Manpower and Tasks Table in the Present Software Chart

Courtesy of Chris Pinkenburg

	A	B	C	D	E	G	H	I	J	K	L
1	**Task**	**Sub-tasks**		**BeenDone**	**LeftToDo/Notes**	**Resolution**		**Relevant presentations**			
2	**Geant4**	**Detector components**	Ladders	Done		CLOSED		1st presentation (starting point)		June 29th	https://indico.bnl.gov/event/10520/
3	Genki Nukazuka		the inner and the outer skins	Done		CLOSED		2nd		octb 12th	https://indico.bnl.gov/event/10537/
4			support tube and service barrel	Done		CLOSED		3rd		Nov. 2nd	https://indico.bnl.gov/event/10538/
5			Bus extender	effective model	it should be enough			4th		Nov. 17	https://indico.bnl.gov/event/10540/
6			Support structure	not yet	Will be implemented once the design is settled (soon)			5th		Nov. 30	https://indico.bnl.gov/event/10542/
7			Cabling	not yet	To be implemented for the pieces may not be negligible			6th		Dec. 14	https://indico.bnl.gov/event/10544/
8			Anything else?					7th			
9											
10	**(mis)Misalignment**	Ladder level									
11	?	wrt other dets.									
12											
13	**x-Calibrations**	beam-test data	adc	To be analyzed	Will be imprelmented after December 2021 beam test						
14	Rikkyo Univ. & NWU		charge diffusion between strips	To be analyzed	Will be imprelmented after December 2021 beam test						
15			acceptance edge effects	To be analyzed	Will be imprelmented after December 2021 beam test						
16			track angle dependence	To be analyzed	Will be imprelmented after December 2021 beam test						
17	**Dead/noisy maps**	cosmic data w/ barrel			Fake map with 1% dead strips generated and uploaded	CLOSED					
18	Han-Sheng Li (Purdue Univ.)										
19	**Monitor stability**	cosmic data w/ barrel		Studied CMS silicon online monitor	Learn sckematic framework for sPHENIX and start developing the monitor for cosmic ray data taking of the assembled barrel in Spring, 2022.						
20	Purdue Univ.										
21											
22											
23	Relevant num. for Alignme	Time for each step									
24		No. events needed									
25											
26		Initial 1-x calibrations									
27		Calibs. filesize									
28		Estimated frequency									
29											
30											

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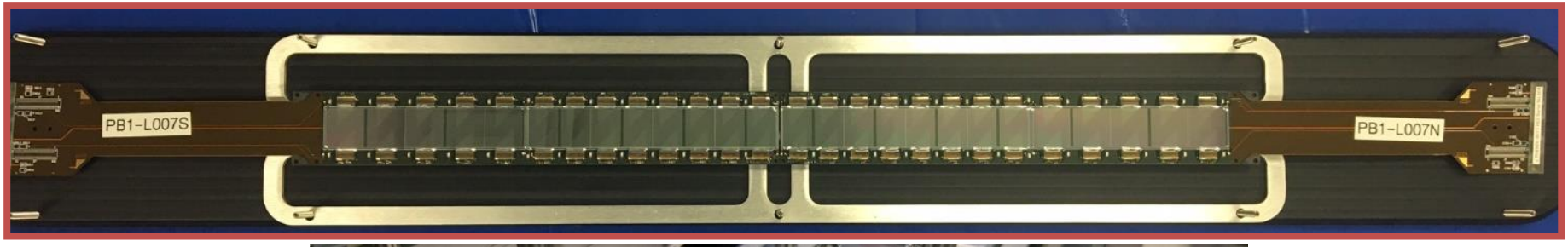
29											
30											

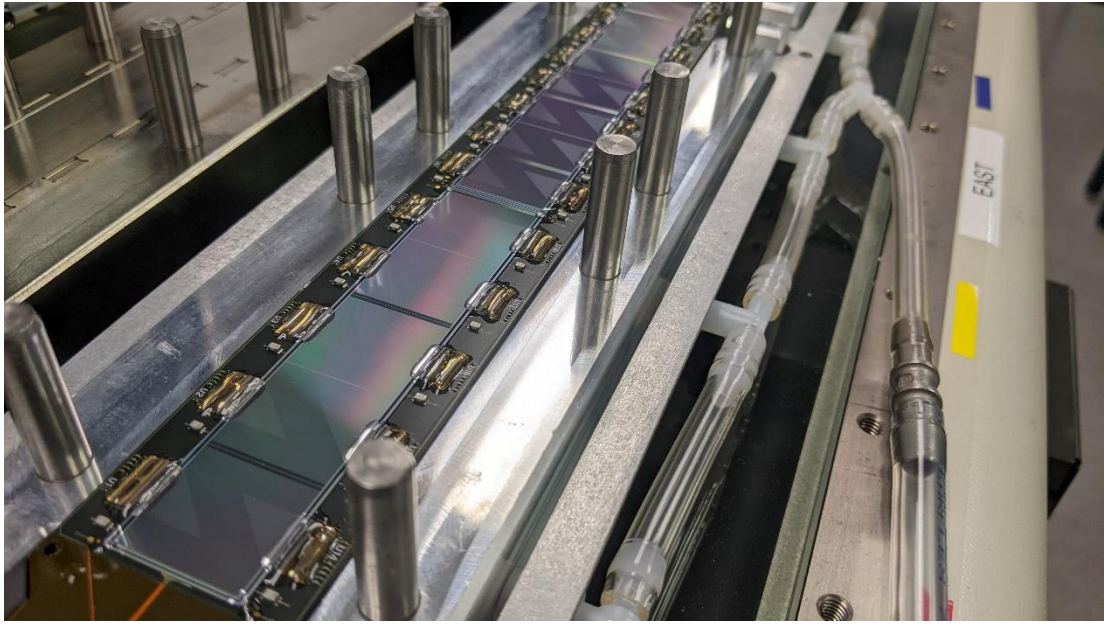
These tasks are not right,

We need to have a well-defined and necessary guidelines

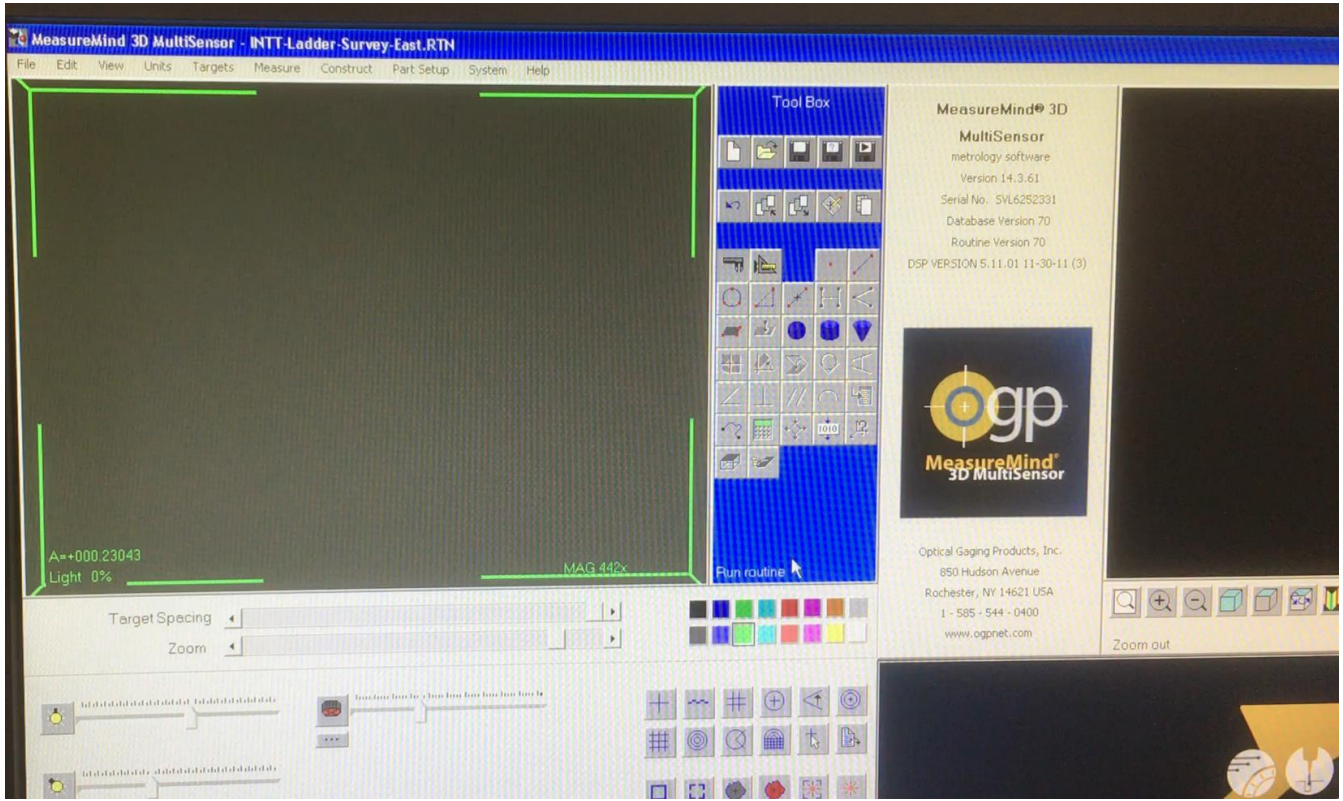
that we can achieve.

What is need for INTT? We need “Ideal” Geometry (important)





“Ideal’ Geometry: 1) Sensor Survey (we have data for each sensor on ladder)



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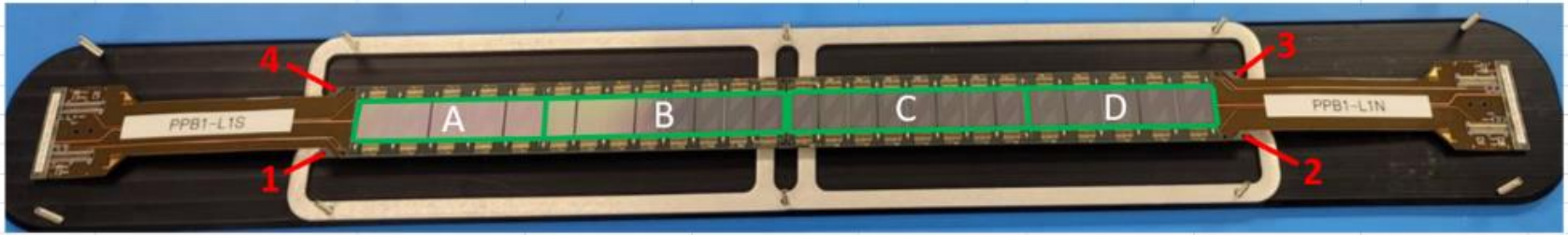


INTT Ladder Serial Number	PB1-L010
Date	6/7/2021

All measurements in mm.

“Ideal’ Geometry: Every Ladder has survey data

```
Machine Serial Number: SVL6252331                                    Page:    1
================================================================================
Routine Name                                      Run #       Date & Time
================================================================================
INTT-Ladder-Survey-East.RTN                          2 Mon Jun 07 16:55:52 2021
================================================================================
================================================================================
Feature      Unit   Nominal     Actual      Tolerances      Deviation   Exceeded
================================================================================

Step 9
X Location    mm            +013.51987
Y Location    mm            +005.95799
Z Location    mm            +000.12883

Step 10
X Location    mm            +115.02095
Y Location    mm            +005.98961
Z Location    mm            +000.18276

Step 11
X Location    mm            +115.01460
Y Location    mm            +027.99301
Z Location    mm            +000.20748

Step 12
X Location    mm            +013.51367
Y Location    mm            +027.96071
Z Location    mm            +000.15855

Step 13
X Location    mm            +115.66764
Y Location    mm            +005.98381
Z Location    mm            +000.18019

Step 14
X Location    mm            +245.16817
Y Location    mm            +005.98826
Z Location    mm            +000.17738
```

We can determine each strip position in sensor relatively to the ladder

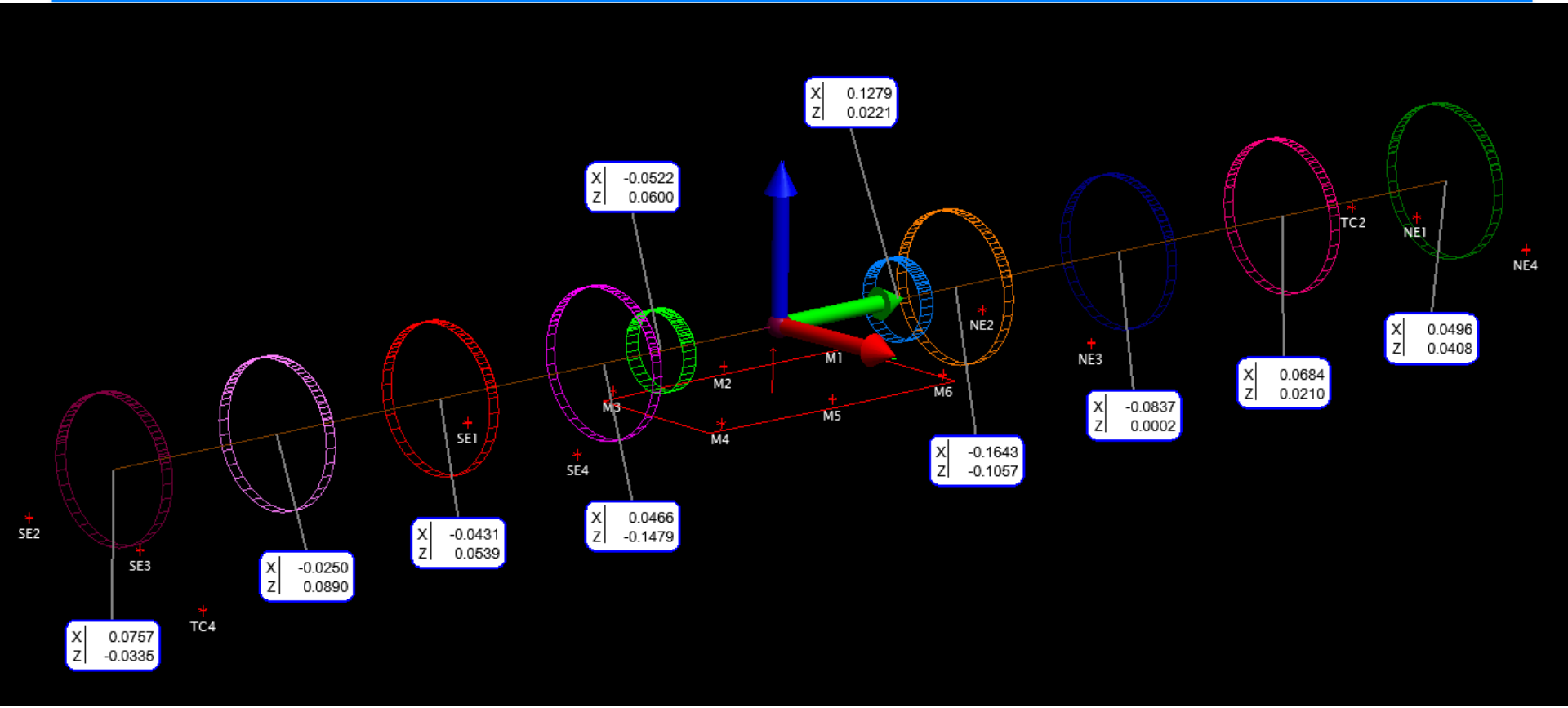
INTT “Ideal’ Geometry: INTT Support Structure Survey

Survey Fixture

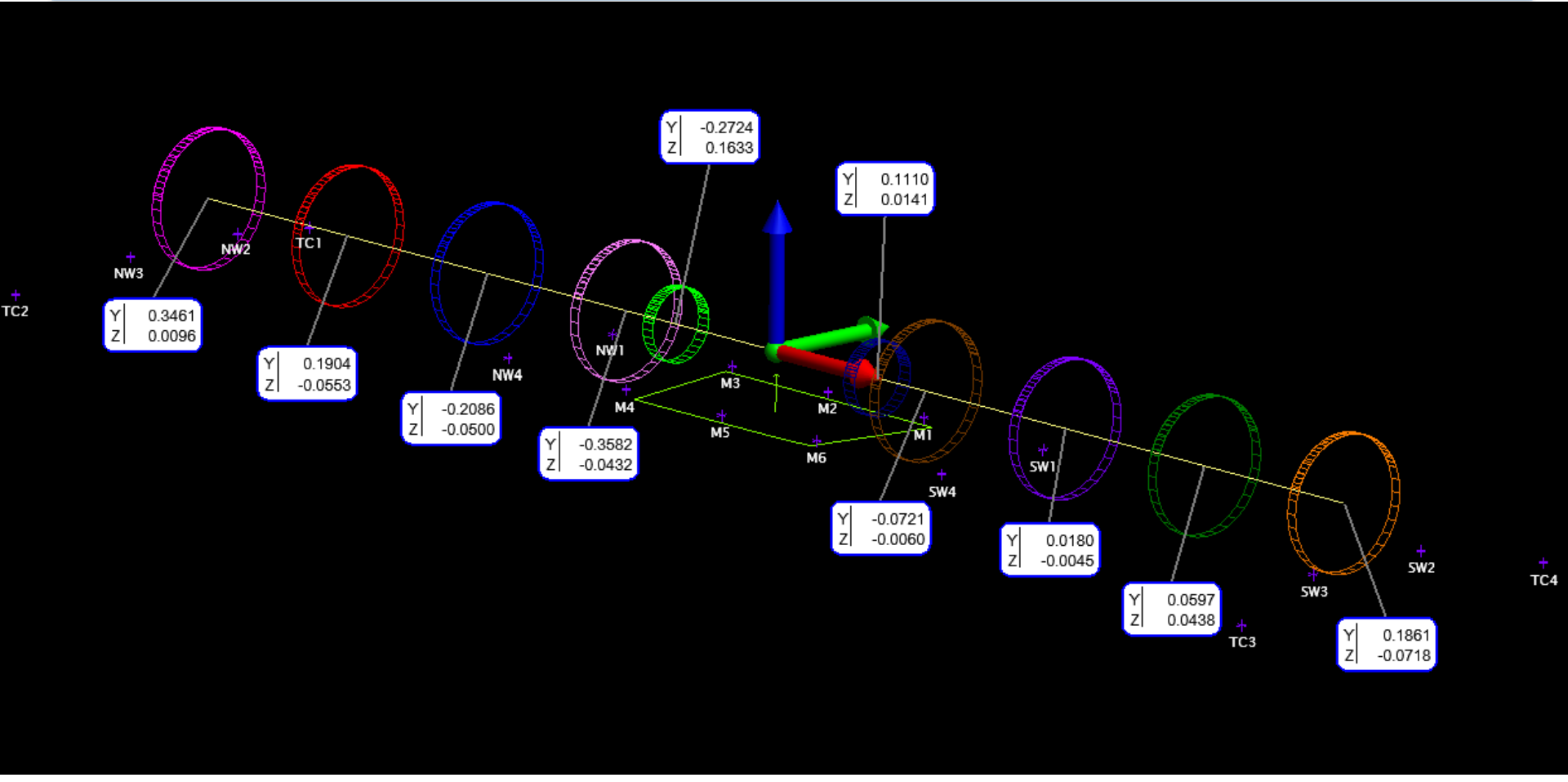
2x Inner Service Barrel, 2x Inner Cone, Inner Skin

INTT “Ideal’ Geometry: INTT Support Structure Survey

INTT “Ideal’ Geometry: INTT Support Structure Survey “EAST”



INTT “Ideal’ Geometry: INTT Support Structure Survey “West”



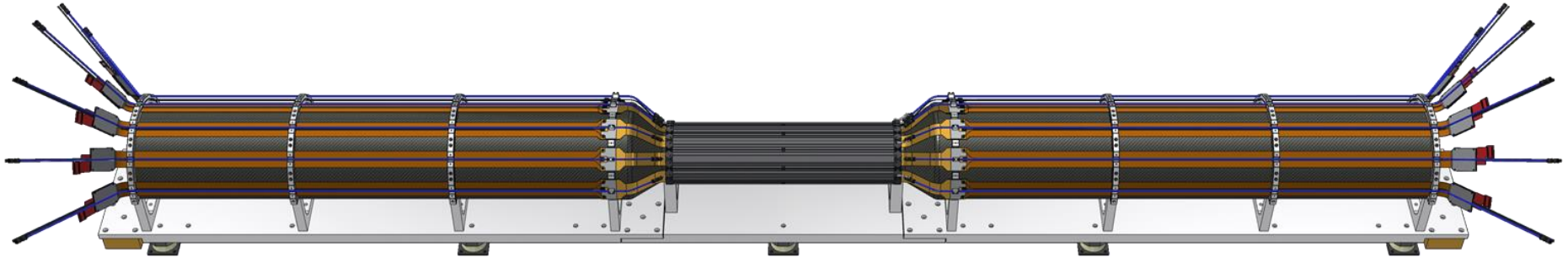
INTT “Ideal’ Geometry: Ladder Survey on each layer

6x Extender Rib A, 2x HDI Rib 1, 2x End Ring 1 – 56x 6-32 (3/8”) Flat Head, 16x 2-56 (3/16”) Flat Head

6x Ladder 1A – 48x 1-64 (3/16”) Button Head

INTT Barrel Assembly – Steps 7 and 8

24x Bias Cable, 12x Thermal Cable, 12x Cooling Tube – Use tape and epoxy as needed



6x Ladder 1B – 48x 1-64 (3/16”) Button Head

INTT “Ideal’ Geometry: Barrels Survey

Barrels Assembly: Mockup Achieved Successfully

Presentation at Software Meeting April 19, 2022

- Software responsible (Senior person or PosDoc with expertise in software)
- Finish Implementation of INTT material in sPHENIX Geant
- Ideal Geometry
- Data unpacking
- Hit thresholds macros, and final thresholds will be with commissioning beam
- Dead/hot channels map macros, and final map will be with commissioning beam
- Online Monitoring plots macros, and references using commissioning beam
- Database macro to transfer dead/hot map, and Geometry
- PostDocs and manpower for commissioning
- LV Gui
- HV Gui

Proposed Chart: still in progress, I will send you the link that you can complete table

	A	B	C	D	E	G	H	I	J	K	L
1	**Task**	**Sub-tasks**		**BeenDone**	**LeftToDo/Notes**	**Resolution**		**Relevant presentations**			
2	**Geant4**	**Detector components**	Ladders	Done		CLOSED		1st presentation (starting point)		June 29th	https://indico.bnl.gov/even
3	Dan Cacace (BNL)		CFC Inner/outer skins	Done		CLOSED		2nd		octb 12th	https://indico.bnl.gov/even
4	Genki Nukazuka (RBRC)		CFC Inner/Outer Service Barrels	Done		CLOSED		3rd		Nov. 2nd	https://indico.bnl.gov/even
5	Rachid Nouicer (BNL)		Bus extender	effective model	it should be enough			4th		Nov. 17	https://indico.bnl.gov/even
6			Support structure	not yet	Will be implemented once the design is settled (soon)			5th		Nov. 30	https://indico.bnl.gov/even
7			Cabling	not yet	To be implemented for the pieces may not be negligible			6th		Dec. 14	https://indico.bnl.gov/even
8			Anything else?					7th			
9											
10	**Ideal Geometry**	Sensors/Ladder									
11	Dan Cacace (BNL)	Ladder/Barrels									
12	Genki Nukazuka (RBRC)	Barrels/INTT									
13	Rachid Nouicer (BNL)	INTT/sPHENIX									
14	Student	Ideal Geometry									
15		Ideal Geometry in Geant									
16											
17											
18	**Calibrations-I**	**beam-test data**	adc	To be analyzed	Will be imprelmented after December 2021 beam test						
19	Rikkyo Univ. & NWU		charge diffusion between strips	To be analyzed	Will be imprelmented after December 2021 beam test						
20			acceptance edge effects	To be analyzed	Will be imprelmented after December 2021 beam test						
21			track angle dependence	To be analyzed	Will be imprelmented after December 2021 beam test						
22											
23											
24	**Calibrations-II**	**Commisioning Beam**									
25	**Names**	macros									
26											
27											
28											
29	**Dead/Hot Map**	**Commisioning Beam**			Fake map with 1% dead strips generated and uploaded	CLOSED					
30	Han-Sheng Li (Purdue Univ.)										
31											
32											
33	**Online Monitoring**	**Commisioning Beam**		Studied CMS	Learn sckematic framework for sPHENIX and start						
34	Purdue Univ.	macros									
35											
36											
37											
38											
39											

Status of the Barrels Assembly

- Survey of the barrels supports structure stands have been done (Surveyors Team)

- Carbon Fiber inner support structure fabrication/delivery by the end of April beginning of May (WorkShape)

- Barrels Assembly ladders/cables will start mid-May and it will be carried out by (Engineers/Technicians)

- Cooling system of each layer and leak testing will be carried out (Rob Pisani)

- Each layer will be tested (Genki, and maybe he needs one student #1 for help)

- Each layer will be surveyed by surveyors team (Doug Gordon)

- Survey Data Analysis in each step will be carried out by Matt, Dan, Genki, student #2, and Rachid

  * number of people in the lab still limit due COVID-19

  * Detector commissioning in the IR is March 2023