

Record Module Loading Info in the ITk Production Database

Jiayi Chen

jennyz@brandies.edu

Brandeis University

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The logo for Brookhaven National Laboratory, featuring the word "BROOKHAVEN" in large, bold, black capital letters, with "NATIONAL LABORATORY" in smaller, black capital letters below it. A stylized grey swoosh with a red dot is positioned behind the text.

Outline

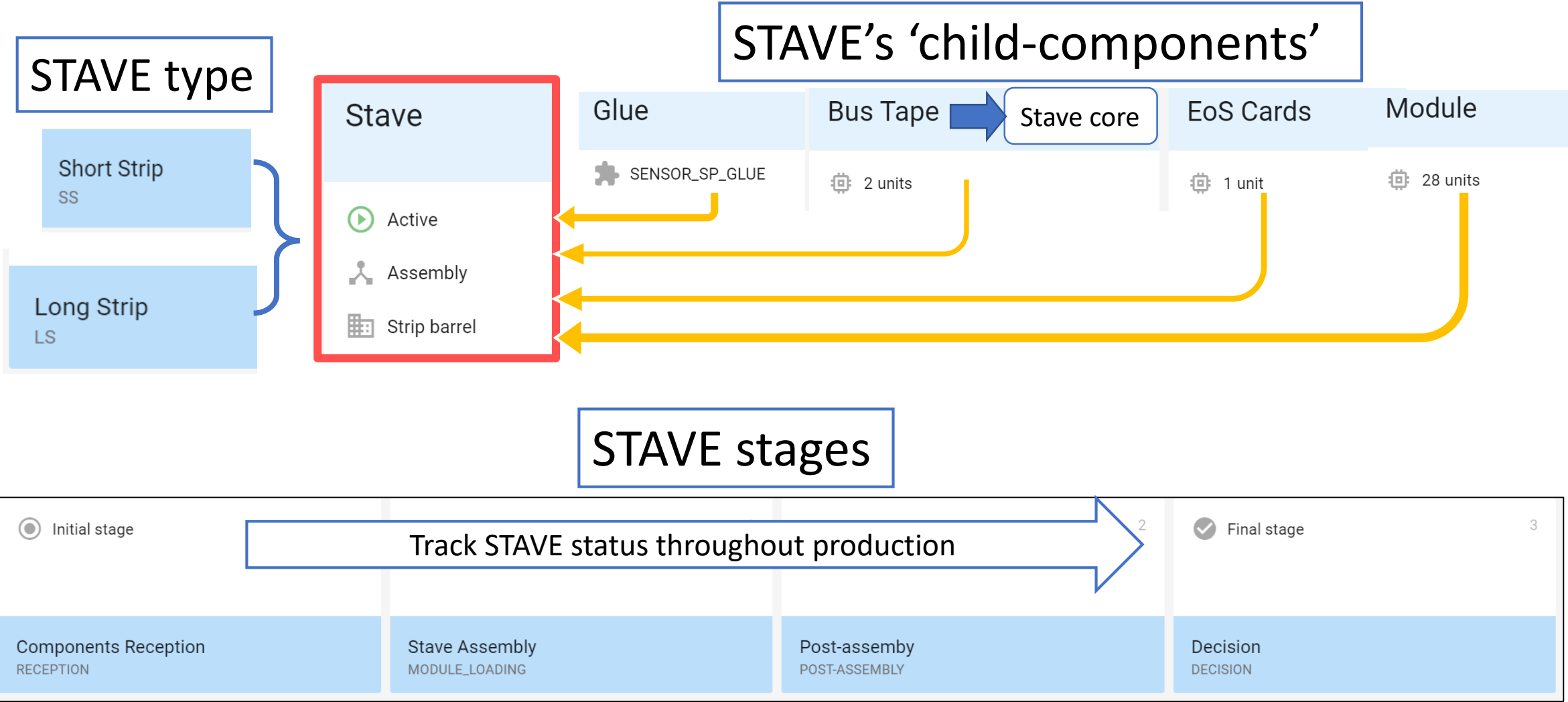
- STAVE definition in the ITk Production Database (PD)
- STAVE-MODULE relation
- Module Placement Accuracy (MPA) Summary test in the ITk PD
- Workflow plan for interfacing with ITk PD during module loading
- Access to ITk PD, STAVE scripts, and additional resource
- Work in progress

*All-cap (STAVE) for database object; lower case (stave) for real world component

STAVE definition in the PD

- What is a STAVE
- STAVE in the User Interface (UI)

What is a STAVE




A STAVE in the UI

Property Name

Entry

Stave - Long Strip

Basic Properties

ATLAS SERIAL NUMBER	PROJECT	 f58ee84ea0c4da534bf48f2487d47164
No ATLAS Serial Number	Strips	
COMPONENT TYPE	SUBPROJECT	
Stave	Strip barrel	
TYPE	REGISTRATION	
Long Strip	20.09.2018 16:22 (Jiayi Chen)	
CURRENT STAGE	OWNER INSTITUTION	
Components Reception	Brandeis University	
CURRENT LOCATION		
Brandeis University		

Properties

Local Name	Stave1	Side (A/C)	A
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Stage History

SET STAGE

20.09.2018 16:22	Components Reception
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STAVE-MODULE relation

- STAVE and MODULEs in the UI
 - Put MODULEs in order
- Associate MODULEs with STAVE using Application Programming Interface (API)

STAVE and MODULEs in the UI

Children

28 children slots for MODULEs for each STAVE

DUMMIES

Module (Short Slim) is missing

Module (Short Slim) is missing

Module (Short Slim) is missing

Module (Short Slim)

Module (Short Slim)

Empty slots

Module (Short Slim)

DISASSEMBLE

Module Postion

9

Survey File Timestamp

8/29/2018 11:38:17 AM EST

Stave Side

RHS

Assembly Site

BU

Calibration File Timestamp

8/28/2018 5:07:56 PM EST

Property Name

Entry

ASSEMBLE

ASSEMBLE

ASSEMBLE

DISASSEMBLE

DISASSEMBLE

DISASSEMBLE

Click to see STAVE-MODULE relation

Put MODULES in order

- We should always put MODULES in the same order to avoid having multiple MODULES 'assembled' at the same position
- If attempt to assemble another MODULE at the same slot, PD will return an error

Ordering Scheme

Slot1: Module Position 1 on side **LHS**

Slot2: Module Position 2 on side **LHS**

.....

Slot14: Module Position 14 on side **LHS**

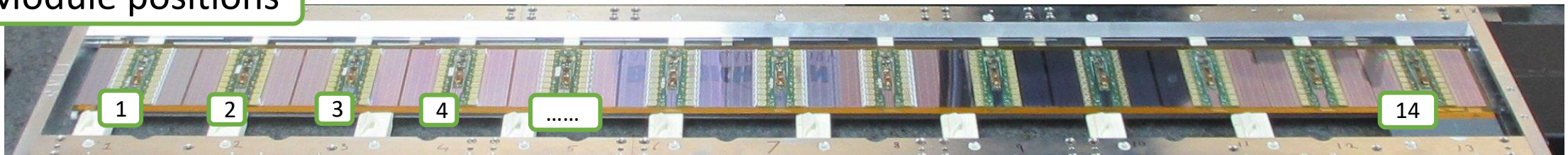
Slot15: Module Position 1 on side **RHS**

Slot16: Module Position 2 on side **RHS**

.....

Slot28: Module Position 14 on side **RHS**

Module positions



Assemble MODULEs using APIs -- LoadedStave.py

1. Initiate: 'python2.7 LoadedStave.py initiate --directory ./Calibrations/ --positions 8,9,10'

(i) register a new STAVE (prompt up will ask for a local name)

```
Welcome to ITk PD STAVE assembly DAY1!  
please give the new STAVE a local name: ShortTestingJiayi  
{'project': 'S', 'properties': {'LOCALNAME': 'ShortTestingJiayi', 'SIDE': 'SS'}, 'componentType': 'STAVE', 'subproject': 'SB', 'type': 'SS', 'institution': 'BU'}
```

(ii) assemble some MODULEs at position 8, 9 and 10

```
OrderedDict([('AG', '8/29/2018 11:38:17 AM'), ('ABR', '8/29/2018 4:07:04 PM')])  
childProperties are: {'POSITION': '9', 'SURVEY': '8/29/2018 11:38:17 AM EST', 'SIDE': 'RHS', 'SITE': 'BU', 'CALIBRATION': '8/28/2018 5:07:56 PM EST'}  
about to assemble module at position 9  
are you sure you want to assemble? (inset 'y' or'n')
```

Automatically fill in child-parent properties

(iii) set STAVE stage to assembly as the first module is assembled

The US electrical stave prototype is assembled using this script:

<https://itkpd-test.unicorncollege.cz/componentView?code=356a296d48b11278ac4d618564880c1c>

Assemble MODULEs using APIs -- LoadedStave.py

2. Update: 'python2.7 LoadedStave.py update --directory ./Calibrations/ --positions 11,12,13'

(i) find the STAVE using local name

```
Welcome back to ITk PD STAVE assembly,!!  
please give the stave local name to find this STAVE: ShortTestingJiayi  
Setup connection  
Getting token  
AccessCode1:  
AccessCode2:  
Sending credentials to get a token  
Found the following stave using local name ShortTestingJiayi  
type(LS/SS): Short Strip  
institution: Brandeis University  
current location: Brandeis University  
Is this the stave you are looking for? (insert 'y' or 'n')
```

(ii) assemble more MODULEs at position 11, 12 and 13

More instruction in git repo (see Slide20)

Module Placement Accuracy Summary Test in the ITk PD

- In the UI
- Upload test using API

Module Placement Accuracy Summary

- summarizes the module placement accuracy for **one side of a stave**

Module Placement Accuracy Summary	
Basic Properties	
INSTITUTION	RUN NUMBER
Brandeis University	RHS
TEST DATE	TEST TYPE
19.02.2019	Module Placement Accuracy Summary
UPLOADED	COMPONENT
Jiayi Chen	Stave
	TESTED IN STAGE
	Stave Assembly

Run number indicates the stave side

Find this test here: <https://itkpd-test.unicorncollege.cz/testRunView?id=5c6cbddb798b4f000947661e>

Module Placement Accuracy Summary - results

Property Name	Entry
Properties	
RMS in Y (um)	15.1
Fiducial Mark Used for Final Survey	Mark E (Slim/17)
RMS in X (um)	10.4
Number of modules failed placement tolerance	5

- Save RMS of all $\Delta x, \Delta y$ (ideal – actual position)

Module Placement Accuracy Summary - results cont'd

Results	Parameter Entry (object): {"A": [Δx, Δy], "B": ...}	
Module (Short Slim) POSITION: 13,SURVEY: 9/5/2018 5:43:46 PM EST,SIDE: RHS,SITE: BU,CALIBRATION: 9/5/2018 5:16:26 PM EST	Passed (um)	{"A":[-7.14,7.44],"C":[0.447,11.2],"B":[-1.34,8.13],"D":[-9,9.74]}
Module (Short Slim) POSITION: 11,SURVEY: 8/30/2018 11:54:48 AM EST,SIDE: RHS,SITE: BU,CALIBRATION: 8/30/2018 11:19:09 AM EST	Passed (um)	{"A":[-18.4,-5.68],"C":[-9.65,-5.66],"B":[-9.78,-7.71],"D":[-19.2,-2.5]}
Module (Short Slim) POSITION: 3,SURVEY: 7/5/2018 5:16:45 P EST,SIDE: RHS,SITE: BU,CALIBRATION: 8/30/2018 11:19:09 AM EST	Passed (um)	{"A":[-4.79,1.93],"C":[0.084,14.2],"B":[-6.79,4.37],"D":[4.22,11.7]}
Module (Short Slim) POSITION: 2,SURVEY: 6/22/2018 4:16:10 P EST,SIDE: RHS,SITE: BU,CALIBRATION: 8/30/2018 11:19:09 AM EST	Failed in X (um)	{"A":[-22.4,-1.18],"C":[2.16,-23.9],"B":[-25.9,-21.8],"D":[4.01,-2.1]}
Module (Short Slim) POSITION: 12,SURVEY: 9/5/2018 12:34:07 PM EST,SIDE: RHS,SITE: BU,CALIBRATION: 9/5/2018 11:46:49 AM EST	Failed in Y (um)	{"A":[11.8,22.5],"C":[-3.51,3.09],"B":[19,0.315],"D":[-11.8,25.4]}

- Store all $[\Delta x, \Delta y]$ (difference between the ideal position and real position from the final survey; unit is *micron*)
- Each MODULE only has one result → each test will always have 14 results
- Each MODULE associated with one parameter: 'Passed', 'Failed in X', 'Failed in Y', 'Failed in X&Y'

Module Placement Accuracy Summary - attachment

Defects		ADD
Attachments	Attach the calibration log of the final survey	UPLOAD
CalibrationResults.ini		▼

Upload using API

uploadModulePlacementAccuracy.py

To upload, you need to specify the directory that contains the module position survey:
> `'python uploadModulePlacementAccuracy.py upload --directory <path to the survey file>'`

```
*****
* *
*                               * *
*                               * *
*                               * *
*****
uploadMPA.py --JiayiChen
*****
CernVM
Software Appliance
please give the STAVE's local name:US-Electrical-Prototype
```

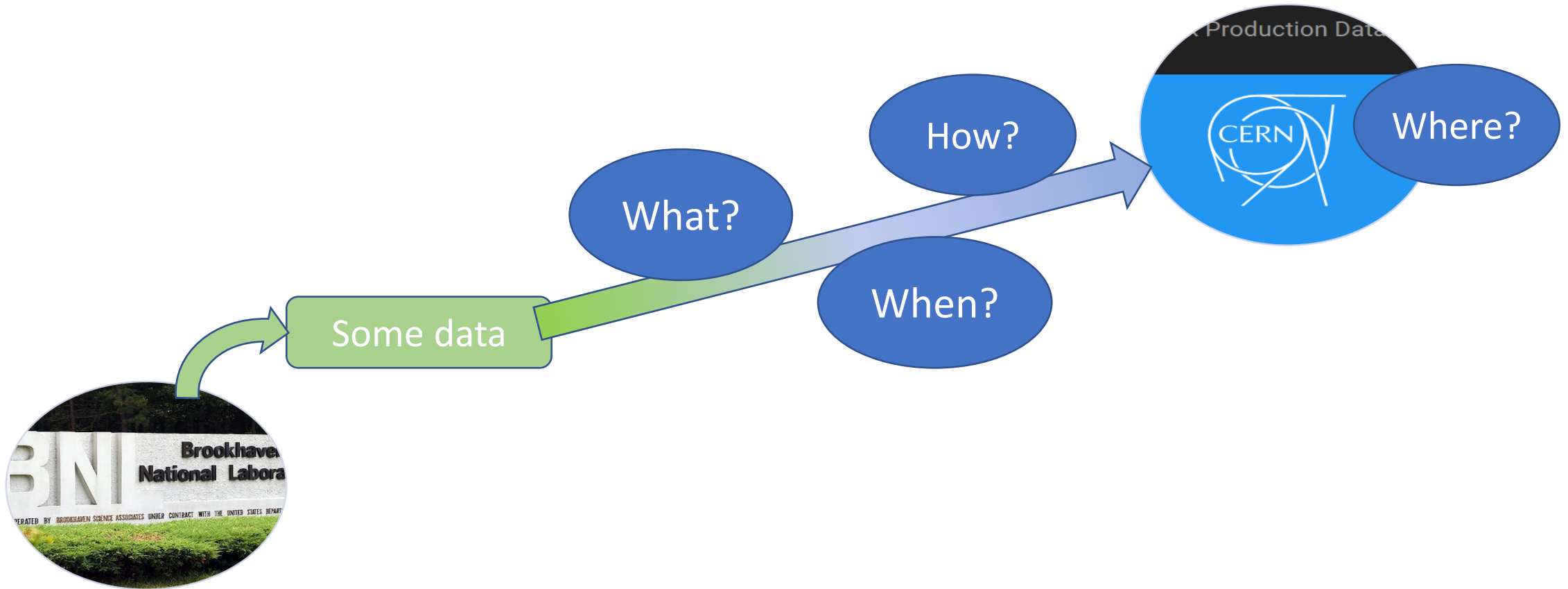
(Program will print DTOin....)

```
Are you sure you want to upload the above test?
yes
attaching the calibration file./ElectricalStaveFinalSurvey/CalibrationResults.ini
finished uploading
```

More instruction in git repo (see Slide20)

Combined workflow plan for STAVE assembly and stave assembly

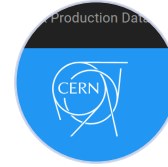
PD workflow plan: the answers to...



Workflow plan



real-world assembly



interfacing database

Step2,4,6 uses
LoadedStave.py

Step 7 uses
uploadMPA.py

1. Move stave core to assembly station;
2. register a new STAVE and assemble CORE;
3. load modules;
4. change STAVE stage to “assembly”;
5. remove the bridge and conduct survey;
6. assemble MODULEs with STAVE;
7. upload survey results.

Getting access and additional resources

Getting access

- Access to ITk PD (<https://itkpd-test.unicorncollege.cz/>): first you need to register at <https://www.plus4u.net/registrace> ; next you should contact Andrew Blue (Andrew.Blue@glasgow.ac.uk) to add you to the correct institute in the database
- Git Repository: we are working towards merging all ITk PD scripts to one single repo: https://gitlab.cern.ch/atlas-itk/sw/db/production_database_scripts
 - One can get access by joining the database mailing group and wait for one day
 - Contact Bruce Gallop (Bruce.Gallop@stfc.ac.uk) if the above method did not work out
 - The branch that has the most up-to-date scripts for STAVE:
[https://gitlab.cern.ch/atlas-itk/sw/db/production_database_scripts/tree/jchen STAVE](https://gitlab.cern.ch/atlas-itk/sw/db/production_database_scripts/tree/jchen_STAVE)

Additional resource

- ITk PD twiki page:
<https://twiki.cern.ch/twiki/bin/viewauth/Atlas/ITKProductionDatabase>
- Stave PD entries according QA/QC plan:
<https://docs.google.com/spreadsheets/d/1ZfOfIG6HfjI4LWZnrRrFeS0xziMlhDbr4p8wCGeKE0o/edit#gid=217674791>
- Recent database meetings:
 - Feb.2019 (<https://indico.cern.ch/event/800370/>);
 - Dec.2018 (<https://indico.cern.ch/event/778492/>);
 - Nov.2018 (<https://indico.cern.ch/event/770330/>).
 - ITk week 2019 (<https://indico.cern.ch/event/726191/#b-307096-strip-production-mana>)

Work in progress

Work in progress...

- A single script to 'synchronize' a database STAVE and a stave at the assembly site
- Reporting:
 - (Periodically) report RMS of module placement over time
 - (Accumulatively) report overall module placement performance for each assembly site in histogram