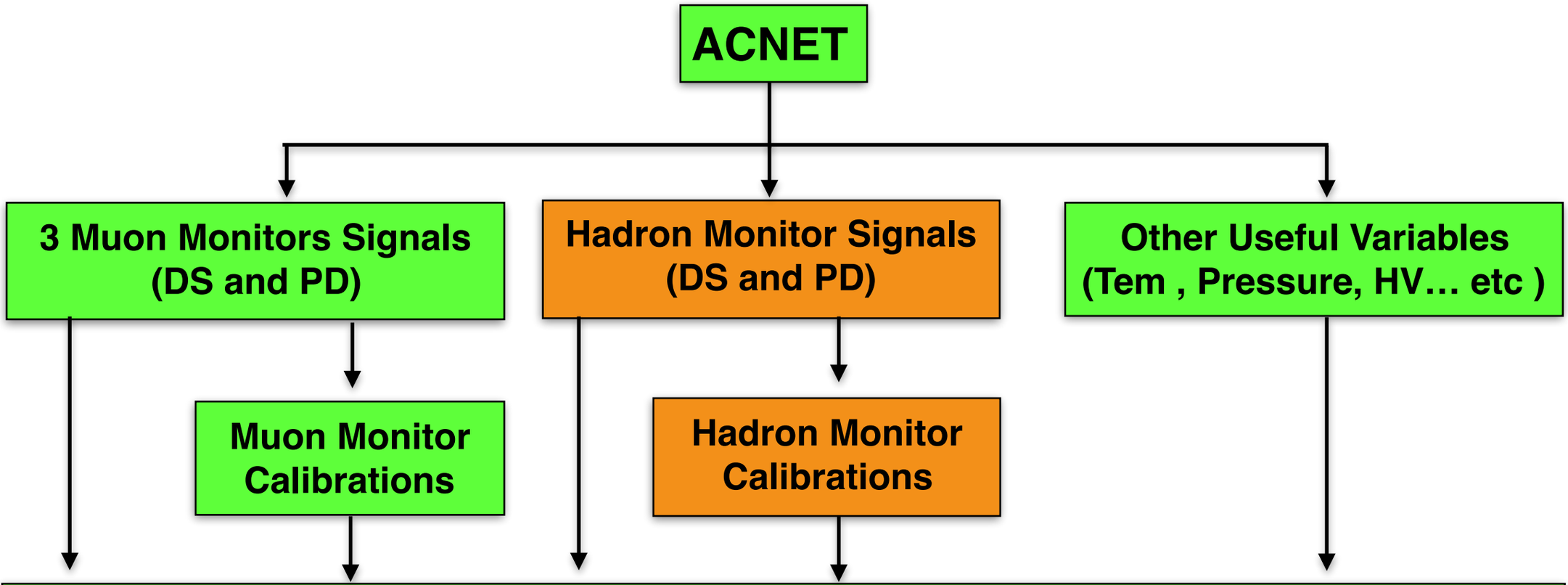
Muon Monitors Data Management Updates

Athula Wickremasinghe

Muon Monitor Working Team Meeting

14/03/2019

Data Management Flow Chart: Data format



Store as pickle files

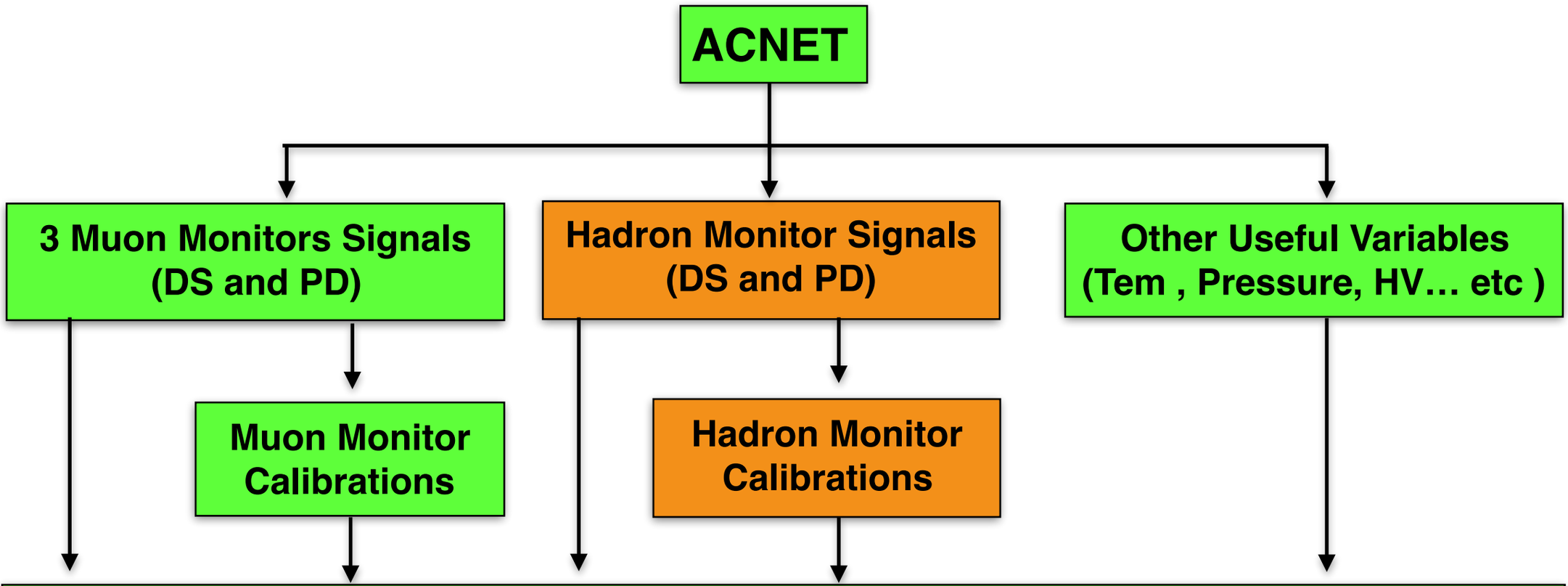
All scripts are written in
- **python 3.7.2 + Pandas**
- **Maybe few shell scripts**

HDF5 binary format has more flexibility to handle with C/C++ , Matlab, Mathematica, Python … etc

Format Type	Data Description	Reader	Writer
text	CSV	read_csv	to_csv
text	JSON	read_json	to_json
text	HTML	read_html	to_html
text	Local clipboard	read_clipboard	to_clipboard
binary	MS Excel	read_excel	to_excel
binary	HDF5 Format	read_hdf	to_hdf
binary	Feather Format	read_feather	to_feather
binary	Parquet Format	read_parquet	to_parquet
binary	Msgpack	read_msgpack	to_msgpack
binary	Stata	read_stata	to_stata
binary	SAS	read_sas	
binary	Python Pickle Format	read_pickle	to_pickle
SQL	SQL	read_sql	to_sql
SQL	Google Big Query	read_gbq	to_gbq

Planing to change it for this format in the future?

Data Management Flow Chart: Variables



Store as pickle files

MM 1-3 : Pixels 104 -199 (skiping unused 137 - 151)

HADM : Pixels 104 - 199 (skipping unused 105 - 151)

HP121 & VP121 : BPM data of 6 measurements (1-7) (mm)

MM#HV 1-3: High Voltage (V)

MM#GPR: Gas Pressure (TORR)

MM#RTD: Temperature (DegF)

MM#GF: Gas Flow (L/hr)

— ? — etc : Needs to be added!!

Note: Missing data points = -9999

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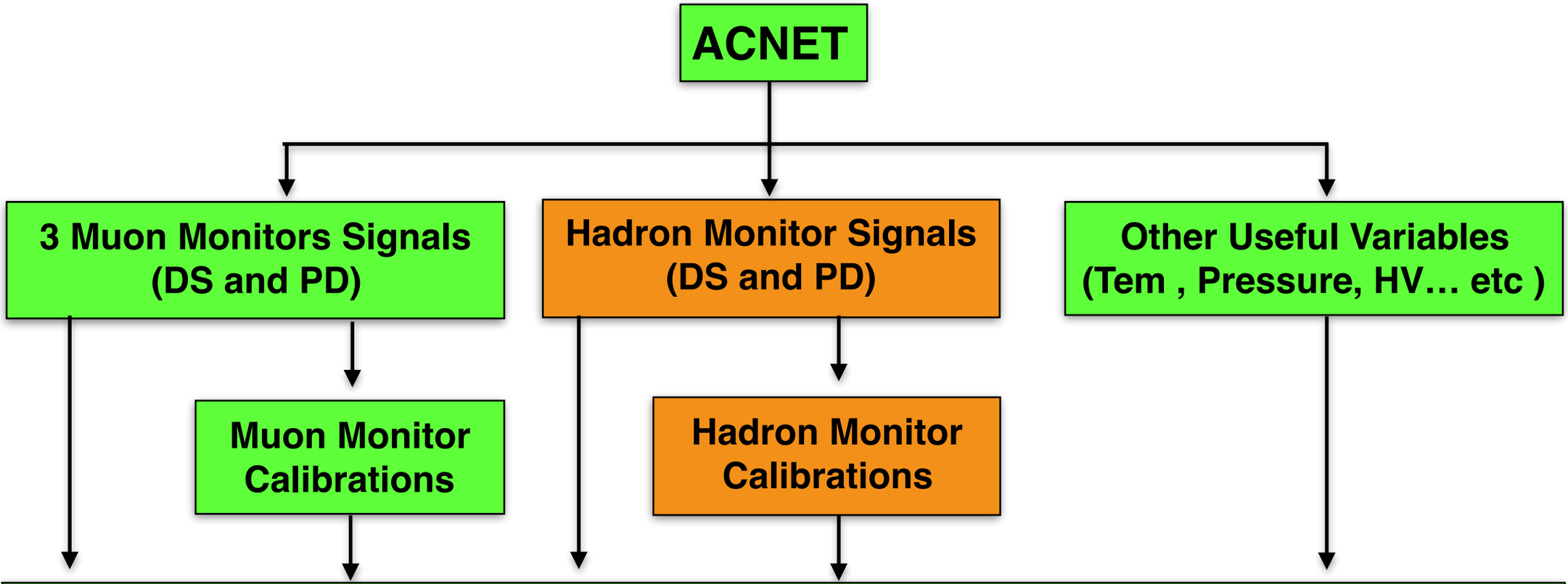
Data Management Flow Chart: Variables



Store as pickle files

Select Devices for Deletion

E:VP110[]	E:VP111[]	E:VP113[]	E:VP116[]	E:VP118[]	E:VP121[]	E:VPB121[]	E:VPB122[]	E:VPBTGT[]	E:VPTGT[]
I:BEAM23[]	I:NUTGDH	I:NUTGDV	I:NUTGUH	I:NUTGUV	E:BAFT1	\FT2	E:HADMDS[]	E:HADMPD[]	E:HI121[]
E:HIB121[]	E:HIB122[]	E:HIBTGT[]	E:HITGT[]	E:HMGPR		\HV2	E:HMHV3	E:HMHV4	E:HMRTD
E:HP101[]	E:HP102[]	E:HP104[]	E:HP105[]			\12[]	E:HP114[]	E:HP115[]	E:HP117[]
E:HP119[]	E:HP121[]	E:HP608[]				E:HPTGT[]	E:HRNDIR	E:M121DS[]	E:MM1GF
E:MM1GPR	E:MM1HV1	E:MM1			E:MM2GF	E:MM2GPR	E:MM2HV1	E:MM2HV2	E:MM2HV3
E:MM2RTD	E:MM3GF	E:MM		…M3HV2	E:MM3HV3	E:MM3RTD	E:MMA1DS[]	E:MMA1PD[]	E:MMA2DS[]
E:MMA2PD[]	E:MMA3DS[]	E:MMA		E:MMA4PD[]	E:MNSISH	E:MNSISV	E:MTGTDS[]	E:NSLINA	E:NSLINB
E:NSLINC	E:NSLIND	E:TGTT	E:TGTT2	E:TGTT3	E:TGTT4	E:TOR101	E:TORTGT	E:TPCT06	E:TPCT07
E:TR101D	E:TRTGTD	E:VI121[]	E:VIB121[]	E:VIB122[]	E:VIBTGT[]	E:VITGT[]	E:VP101[]	E:VP103[]	E:VP106[]
E:VP108[]	L:CBAR	E:MGSMPD[104]	E:MGSMPD[105]	E:MGSMPD[106]	E:TGTPWR				

We are not planing to store all of them but important variables for muon monitor studies

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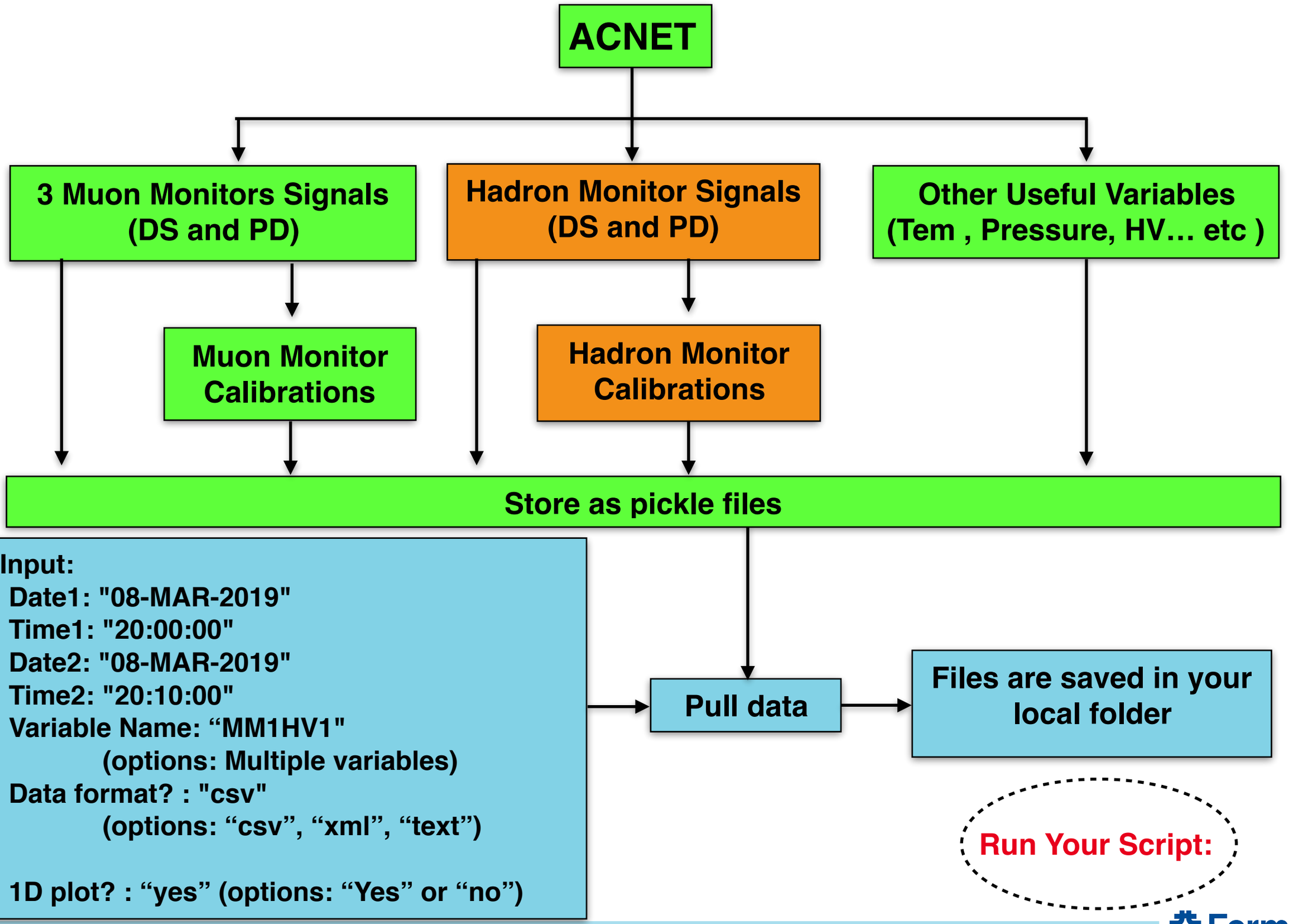
Data Management Flow Chart: User level



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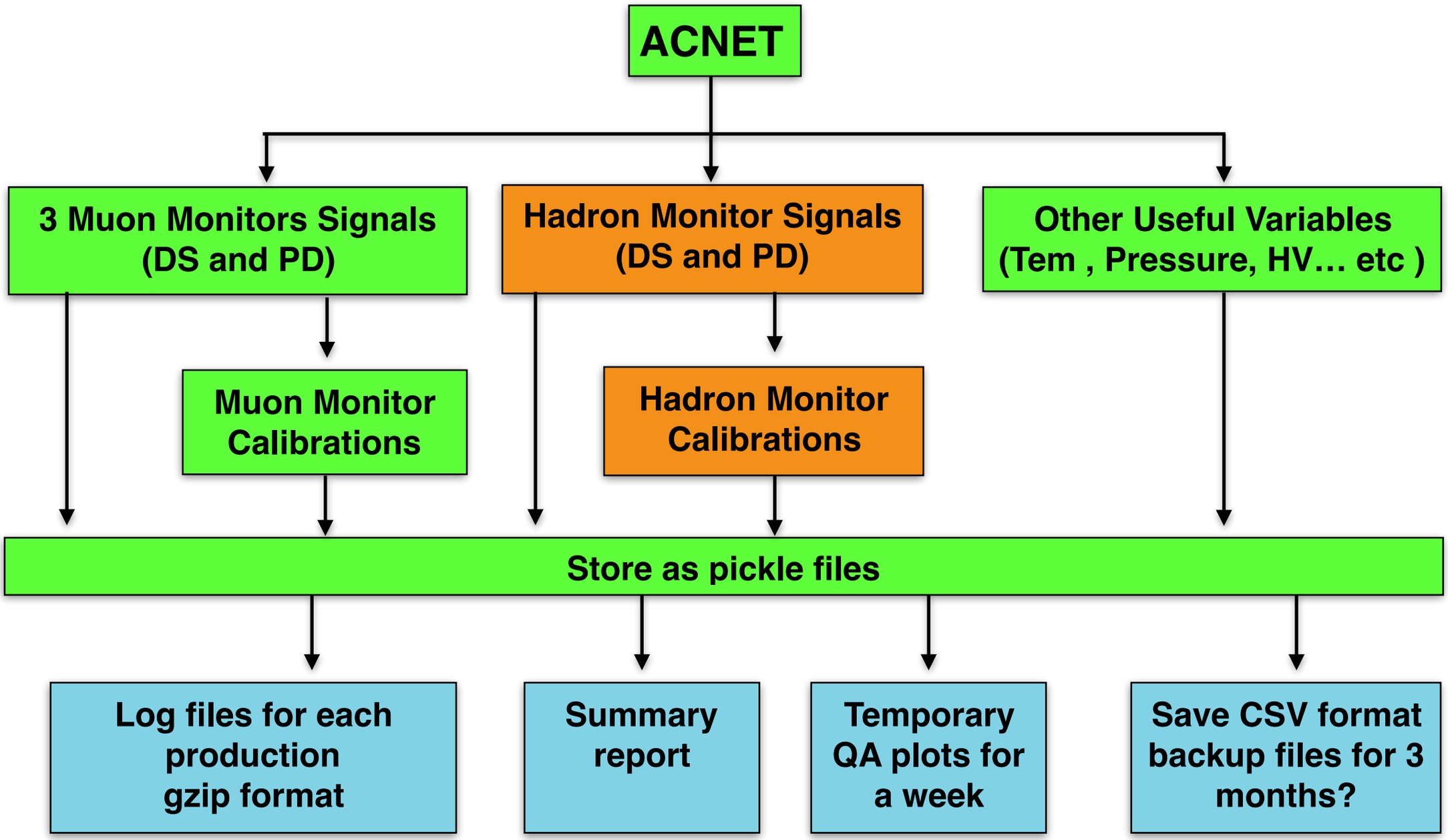
Data Management Flow Chart: Tracking the process



- **We are planing to recover missing data by searching the IF beam data server after investigating the issue with ACNET data server**

Fermilab

Organizing Folders

Search

__pycache__
ACNETdataM...nMonitors.py
ACNETdataVariables_v1.py
CalibData
CSV_data
data
jobOptions
logs

2019-03-12

00/00/00
00/30/00

runJob.sh

```
#!/bin/bash
#!/usr/bin/env python3
date1=12-Mar-2019
time1=00:00:00
date2=12-Mar-2019
time2=00:30:00
fileNameOrder=data/
2019-03-12/00:00:00/test
python3 Main.py ${date1}
${time1} ${date2} $
```

Search

__pycache__
ACNETdataM...nMonitors.py
ACNETdataVariables_v1.py
CalibData
CSV_data
data
jobOptions

2019-03-12
Old

00/00/00
00/30/00

test_12-Mar-2019T00/00/00-12-Mar-2019T00/30/00_all.pkl
test_12-Mar-2019T00/00/00-...-2019T00/30/00_hpvp121.pkl

00/00/00

Search

__pycache__
ACNETdataM...nMonitors.py
ACNETdataVariables_v1.py
CalibData
CSV_data
data
jobOptions
logs
Main.py
runJobs_single.sh
subJobs.py
subJobs.sh
Tools
Utility.py

2019-03-12

00/00/00
00/30/00

test_12-Mar-...0/30/00.log

```
12-Mar-2019 00:00:00 12-
Mar-2019 00:30:00
12-Mar-2019 00:00:00 12-
Mar-2019 00:30:00
http://www-bd.fnal.gov/
cgi-bin/acl.pl?
acl=logger_get/start=12-
Mar-2019-00:00:00/end=12-
Mar-2019-00:30:00/
node=numi+E:MM1HV1
12-Mar-2019 00:00:00 12-
Mar-2019 00:30:00
http://www-bd.fnal.gov/
cgi-bin/acl.pl?
acl=logger_get/start=12-
Mar-2019-00:00:00/end=12-
Mar-2019-00:30:00/
node=numi+E:MM1HV2
12-Mar-2019 00:00:00 12-
Mar-2019 00:30:00
http://www-bd.fnal.gov/
cgi-bin/acl.pl?
```

Automated program will create all directories and sub directories according to the date and time

Log file example: Good run

```
         mm104_cal    mm105_cal  ...    mm198_cal    mm199_cal
count  1226.000000  1226.000000  ...  1226.000000  1226.000000
mean     -0.470100    -0.470388  ...    -0.341151    -0.426007
std       0.009559     0.007242  ...     0.007125     0.008827
min      -0.508523    -0.499900  ...    -0.370869    -0.461525
25%      -0.475005    -0.474549  ...    -0.344943    -0.430798
50%      -0.469897    -0.470221  ...    -0.340833    -0.425832
75%      -0.464790    -0.466202  ...    -0.337039    -0.420944
max      -0.437336    -0.445798  ...    -0.315856    -0.395105

[8 rows x 81 columns]
12-Mar-2019 00:00:00 12-Mar-2019 00:30:00
http://www-bd.fnal.gov/cgi-bin/acl.pl?acl=logger_get/start=12-Mar-2019-00:00:00/end=12-Mar-2019-00:30:00/node=numi+E:MM1HV1
12-Mar-2019 00:00:00 12-Mar-2019 00:30:00
http://www-bd.fnal.gov/cgi-bin/acl.pl?acl=logger_get/start=12-Mar-2019-00:00:00/end=12-Mar-2019-00:30:00/node=numi+E:MM1HV2
12-Mar-2019 00:00:00 12-Mar-2019 00:30:00
http://www-bd.fnal.gov/cgi-bin/acl.pl?acl=logger_get/start=12-Mar-2019-00:00:00/end=12-Mar-2019-00:30:00/node=numi+E:MM1HV3
              val
count   15.000000
mean  -296.926667
std      1.543404
min   -299.700000
25%   -298.050000
50%   -296.200000
75%   -295.800000
max   -295.700000
               val
count  1241.000000
mean   -292.968654
std       2.268531
min    -296.300000
25%    -295.300000
50%    -292.500000
75%    -291.300000
max    -282.700000
              val
count   15.000000
mean  -297.980000
std       1.923984
min   -300.800000
25%   -299.150000
50%   -297.800000
75%   -296.900000
max   -294.600000
```

In the log file, we are able to see a summary of the run including the number of counts, mean, std, max and min for each table

Log file example: Failed run

```
Ooops! Please check your inputs.
****  Not recording Muon Counter3 data for your selected time region: ************
11-MAR-2019 10:00:00 11-MAR-2019 10:10:00
http://www-bd.fnal.gov/cgi-bin/acl.pl?acl=logger_get/start=11-MAR-2019-10:00:00/end=11-MAR-2019-10:10:00/node=numi+E:MM1HV1
Ooops! Please check your inputs.
****  Not recording Muon Counters HV data for your selected time region: ************
11-MAR-2019 10:00:00 11-MAR-2019 10:10:00
http://www-bd.fnal.gov/cgi-bin/acl.pl?acl=logger_get/start=11-MAR-2019-10:00:00/end=11-MAR-2019-10:10:00/node=numi+E:MM1GPR
Ooops! Please check your inputs.
****  Not recording Muon Counters Gas Pressure data for your selected time region: ************
Empty DataFrame
Columns: []
Index: []
11-MAR-2019 10:00:00 11-MAR-2019 10:10:00
http://www-bd.fnal.gov/cgi-bin/acl.pl?acl=logger_get/start=11-MAR-2019-10:00:00/end=11-MAR-2019-10:10:00/node=numi+E:MM1RTD
Ooops! Please check your inputs.
****  Not recording Muon Counters Temperature data for your selected time region: ************
11-MAR-2019 10:00:00 11-MAR-2019 10:10:00
http://www-bd.fnal.gov/cgi-bin/acl.pl?acl=logger_get/start=11-MAR-2019-10:00:00/end=11-MAR-2019-10:10:00/node=numi+E:VP121[1]
http://www-bd.fnal.gov/cgi-bin/acl.pl?acl=logger_get/start=11-MAR-2019-10:00:00/end=11-MAR-2019-10:10:00/node=numi+E:VP121[2]
http://www-bd.fnal.gov/cgi-bin/acl.pl?acl=logger_get/start=11-MAR-2019-10:00:00/end=11-MAR-2019-10:10:00/node=numi+E:VP121[3]
http://www-bd.fnal.gov/cgi-bin/acl.pl?acl=logger_get/start=11-MAR-2019-10:00:00/end=11-MAR-2019-10:10:00/node=numi+E:VP121[4]
http://www-bd.fnal.gov/cgi-bin/acl.pl?acl=logger_get/start=11-MAR-2019-10:00:00/end=11-MAR-2019-10:10:00/node=numi+E:VP121[5]
http://www-bd.fnal.gov/cgi-bin/acl.pl?acl=logger_get/start=11-MAR-2019-10:00:00/end=11-MAR-2019-10:10:00/node=numi+E:VP121[6]
Ooops! Please check your inputs.
****  Not recording VP121 data for your selected time region: ************
```

- At this point, we are able to see the see all of the data recording issues
- Have to dig more details of the issue and maybe need to go for the recovery plan using IF beam data server

Testing CSV data: Muon Monitor 1

	date	time	mm104_ca	mm105_cal	mm106_cal	mm107_cal	mm108_cal	mm109_cal	mm110_cal	mm111_cal	mm112_cal	mm113_cal	mm114_cal	mm115_cal	mm116_cal	mm
0	12-MAR-2019	00:00:00.648	-0.4794738	-0.478568074	-0.454779806	-0.405578481	-0.300320450	-0.214887845	-0.212257758	-0.325870530	-0.405522625	-0.464664446	-0.472598038	-0.45927304789	-0.397534111	
1	12-MAR-2019	00:00:01.981	-0.4689394	-0.469602650	-0.445063626	-0.398656264	-0.294277777	-0.211406605	-0.204969940	-0.316887415	-0.397126076	-0.456950900	-0.464731889	-0.450950658	-0.390195012	
2	12-MAR-2019	00:00:03.315	-0.4686202	-0.469602650	-0.445690476	-0.398970915	-0.293975648	-0.211090123	-0.205577258	-0.317197183	-0.397748043	-0.457259437	-0.464731889	-0.4512588898	-0.390806603	-0.2
3	12-MAR-2019	00:00:04.648	-0.4714932	-0.471148417	-0.448197876	-0.401488081	-0.296996980	-0.213621937	-0.205880922	-0.318436234	-0.398370010	-0.456950890	-0.466305123	-0.45310831090	-0.391723984	-0.2
4	12-MAR-2019	00:00:05.981	-0.4631934	-0.466820273	-0.443183086	-0.396139098	-0.291256455	-0.209191261	-0.203147975	-0.314409313	-0.392461318	-0.453556932	-0.462214734	-0.44817652129	-0.388054449	
5	12-MAR-2019	00:00:07.314	-0.4520206	-0.458164006	-0.433780326	-0.387958309	-0.282494579	-0.201279335	-0.195252839	-0.303877368	-0.384997713	-0.447077545	-0.453090002	-0.44047059499	-0.381632741	-0.2
6	12-MAR-2019	00:00:14.179	-0.4667049	-0.468056882	-0.444750206	-0.398970915	-0.292767116	-0.210773640	-0.205273594	-0.315338596	-0.394638207	-0.454791101	-0.462214734	-0.450950658	-0.390195012	-0.2
7	12-MAR-2019	00:00:15.511	-0.4730893	-0.472694174	-0.450391856	-0.402746664	-0.296392714	-0.212356030	-0.208917503	-0.320604568	-0.400857878	-0.460653404	-0.467878357	-0.4561906794	-0.393864556	
8	12-MAR-2019	00:00:16.845	-0.4536167	-0.457545701	-0.435347456	-0.388587601	-0.282494589	-0.202545243	-0.194038213	-0.304496904	-0.384686725	-0.447694629	-0.456551110	-0.44139531060	-0.382550133	
9	12-MAR-2019	00:00:18.178	-0.4676625	-0.470220954	-0.445377056	-0.398341624	-0.293975639	-0.209824205	-0.204666286	-0.315958121	-0.397126065	-0.456950900	-0.465675832	-0.4521835953	-0.391112393	-0.2
10	12-MAR-2019	00:00:19.511	-0.4740470	-0.474549088	-0.451018706	-0.404005257	-0.298205513	-0.214887845	-0.208613849	-0.319985042	-0.400857878	-0.459419236	-0.466934415	-0.4540330265	-0.394476147	
11	12-MAR-2019	00:00:20.844	-0.4836237	-0.481041294	-0.455720076	-0.409039579	-0.304852442	-0.218685567	-0.215598012	-0.330207219	-0.409565406	-0.466207161	-0.473856631	-0.461122469	-0.399368883	-0.3
12	12-MAR-2019	00:00:22.176	-0.4842622	-0.481041294	-0.457600636	-0.409983521	-0.305758846	-0.219318520	-0.214383376	-0.327729117	-0.408010493	-0.465590077	-0.473856621	-0.461122469	-0.397534101	
13	12-MAR-2019	00:00:23.508	-0.4737278	-0.473930783	-0.450078426	-0.403375955	-0.295788447	-0.212039548	-0.207399212	-0.319675275	-0.401790823	-0.462813194	-0.470710163	-0.4561906794	-0.395393538	
14	12-MAR-2019	00:00:24.842	-0.4826660	-0.479495527	-0.456346936	-0.408724938	-0.303643909	-0.217736141	-0.212865076	-0.326490066	-0.406766559	-0.465281530	-0.473227329	-0.4601977635	-0.398145691	
15	12-MAR-2019	00:00:26.174	-0.4577666	-0.459709762	-0.437541426	-0.389846184	-0.283703112	-0.203178196	-0.197378458	-0.307594532	-0.387485571	-0.451397143	-0.458753625	-0.44447767909	-0.383467514	-0.2
16	12-MAR-2019	00:00:27.507	-0.4737278	-0.472694174	-0.448824726	-0.402117373	-0.294579915	-0.209824215	-0.209221167	-0.320914336	-0.401168866	-0.461887572	-0.469451580	-0.4546494901	-0.392947175	
17	12-MAR-2019	00:00:28.841	-0.4670241	-0.469293492	-0.444436776	-0.398026973	-0.291558583	-0.209507733	-0.204362622	-0.315958121	-0.396504109	-0.456642353	-0.463158666	-0.4497177005	-0.389277621	-0.2
18	12-MAR-2019	00:00:30.174	-0.4813892	-0.475785698	-0.452899256	-0.405578470	-0.301831110	-0.217103188	-0.213776058	-0.326180308	-0.405522636	-0.460036310	-0.470710163	-0.4574236268	-0.395699339	
19	12-MAR-2019	00:00:31.507	-0.4839429	-0.481659598	-0.456660356	-0.409039579	-0.303039643	-0.218052613	-0.212865076	-0.328038875	-0.408632471	-0.465281540	-0.473856621	-0.4620471745	-0.398757282	-0.3
20	12-MAR-2019	00:00:32.838	-0.4845814	-0.479495527	-0.454779816	-0.407151715	-0.303946047	-0.218369095	-0.215598012	-0.327419349	-0.408010504	-0.463430278	-0.472283387	-0.4601977635	-0.399063073	-0.3
21	12-MAR-2019	00:00:34.171	-0.4692587	-0.470220954	-0.446003906	-0.399600207	-0.292464988	-0.210140697	-0.204362612	-0.316577647	-0.396504109	-0.457567984	-0.468192998	-0.4518753635	-0.391112403	
22	12-MAR-2019	00:00:35.505	-0.4673433	-0.468056882	-0.444123356	-0.398026973	-0.290652189	-0.208558308	-0.204362622	-0.317197183	-0.396504098	-0.457876521	-0.465361191	-0.4503341843	-0.390806603	-0.2
23	12-MAR-2019	00:00:36.838	-0.4788354	-0.477331465	-0.455093236	-0.404949179	-0.303039643	-0.217103188	-0.212865086	-0.325870540	-0.405211647	-0.461887562	-0.471339455	-0.45834833230	-0.396922510	
24	12-MAR-2019	00:00:38.170	-0.4647895	-0.466201968	-0.442556236	-0.395824458	-0.290652179	-0.208241826	-0.202540667	-0.313170261	-0.394638207	-0.455099638	-0.462214723	-0.4484847632	-0.386831258	-0.2
25	12-MAR-2019	00:00:39.503	-0.4667049	-0.467747735	-0.442869656	-0.397083041	-0.291860711	-0.209191261	-0.204058968	-0.314099545	-0.394016230	-0.453556932	-0.461585432	-0.4497177106	-0.388666030	-0.2
26	12-MAR-2019	00:00:40.836	-0.4651088	-0.466201968	-0.441929386	-0.397083041	-0.290047913	-0.208558308	-0.203147985	-0.313789787	-0.393394263	-0.453865469	-0.462214723	-0.44879299500	-0.388971830	-0.2
27	12-MAR-2019	00:00:42.168	-0.4660664	-0.467747735	-0.443496506	-0.394880515	-0.289745784	-0.206026483	-0.202540657	-0.314099555	-0.395260174	-0.456333816	-0.465361181	-0.44910122680	-0.388360240	-0.2

Testing CSV data: HP121 & VP121

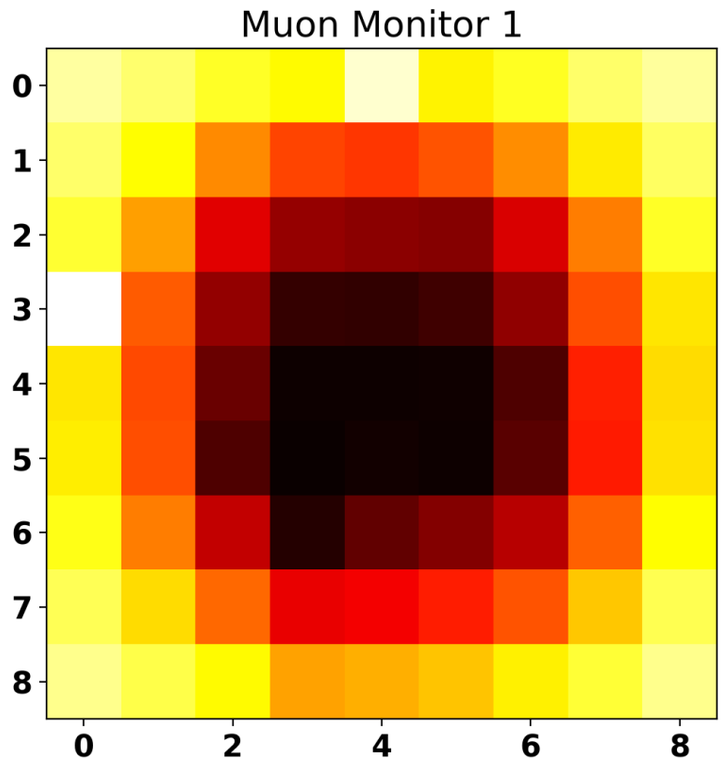
test_12-Mar-2019T00:00:00-12-Mar-2019T00:30:00_hpvp121

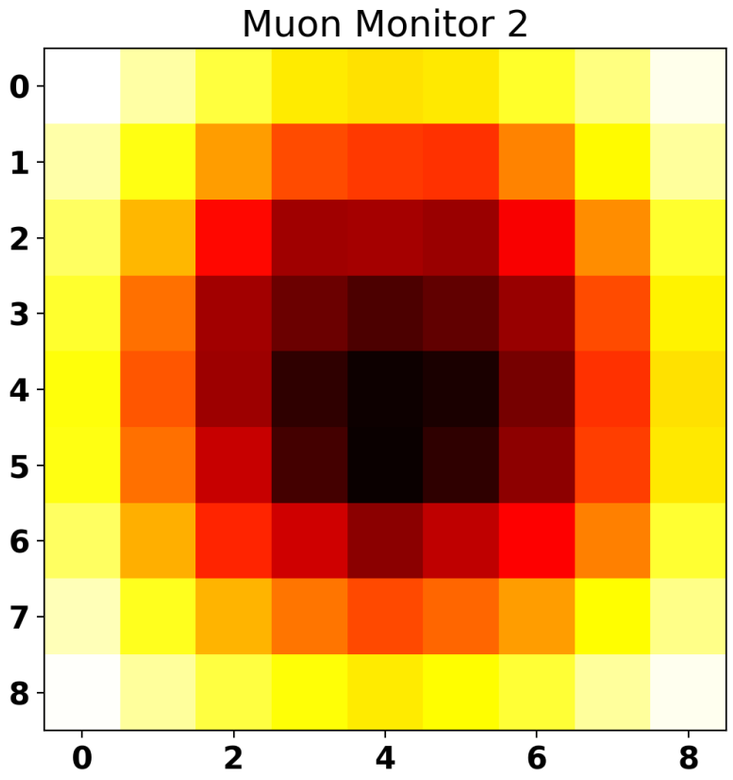
		date	time	d1	d2	d3	d4	d5	d6
HP121	0	12-MAR-2019	00:00:00.649	-1.157	-0.7385	-0.5435	-0.5234	-0.5061	-0.4572
HP121	1	12-MAR-2019	00:00:01.982	-1.039	-0.6225	-0.4782	-0.4203	-0.4287	-0.3472
HP121	2	12-MAR-2019	00:00:03.315	-1.092	-0.7138	-0.5696	-0.483	-0.5049	-0.4459
HP121	3	12-MAR-2019	00:00:04.649	-1.046	-0.6297	-0.5567	-0.4941	-0.5119	-0.377
HP121	4	12-MAR-2019	00:00:05.982	-1.104	-0.7706	-0.536	-0.4624	-0.4315	-0.415
HP121	5	12-MAR-2019	00:00:07.315	-1.086	-0.7103	-0.5196	-0.5047	-0.4568	-0.3957
HP121	6	12-MAR-2019	00:00:14.180	-1.111	-0.6905	-0.6048	-0.5034	-0.5372	-0.4568
HP121	7	12-MAR-2019	00:00:15.513	-1.04	-0.6636	-0.5259	-0.4667	-0.4295	-0.3858
HP121	8	12-MAR-2019	00:00:16.846	-1.111	-0.694	-0.5465	-0.516	-0.5047	-0.4569
HP121	9	12-MAR-2019	00:00:18.179	-1.011	-0.6282	-0.4727	-0.3967	-0.3908	-0.3514
HP121	10	12-MAR-2019	00:00:19.512	-1.103	-0.6624	-0.5757	-0.4519	-0.4735	-0.4515
HP121	11	12-MAR-2019	00:00:20.845	-1.004	-0.6215	-0.4334	-0.4046	-0.3845	-0.3473
HP121	12	12-MAR-2019	00:00:22.177	-1.052	-0.6786	-0.5055	-0.4709	-0.4704	-0.4182
HP121	13	12-MAR-2019	00:00:23.510	-1.016	-0.5912	-0.4572	-0.3751	-0.4222	-0.3485
HP121	14	12-MAR-2019	00:00:24.843	-1.065	-0.6589	-0.5379	-0.5024	-0.5042	-0.4235
HP121	15	12-MAR-2019	00:00:26.176	-1.043	-0.6218	-0.4434	-0.425	-0.4106	-0.3227
HP121	16	12-MAR-2019	00:00:27.509	-1.048	-0.5655	-0.5082	-0.4322	-0.4663	-0.3651
HP121	17	12-MAR-2019	00:00:28.842	-1.062	-0.6302	-0.5104	-0.4193	-0.4258	-0.3484
HP121	18	12-MAR-2019	00:00:30.175	-1.027	-0.7113	-0.4688	-0.457	-0.4019	-0.3751
HP121	19	12-MAR-2019	00:00:31.507	-1.002	-0.496	-0.5113	-0.4417	-0.4975	-0.3889
HP121	20	12-MAR-2019	00:00:32.840	-1.003	-0.6408	-0.4704	-0.4028	-0.38	-0.3396
HP121	21	12-MAR-2019	00:00:34.173	-1.074	-0.6705	-0.5027	-0.4528	-0.438	-0.3973
HP121	22	12-MAR-2019	00:00:35.506	-0.9919	-0.5582	-0.391	-0.3752	-0.3544	-0.3086

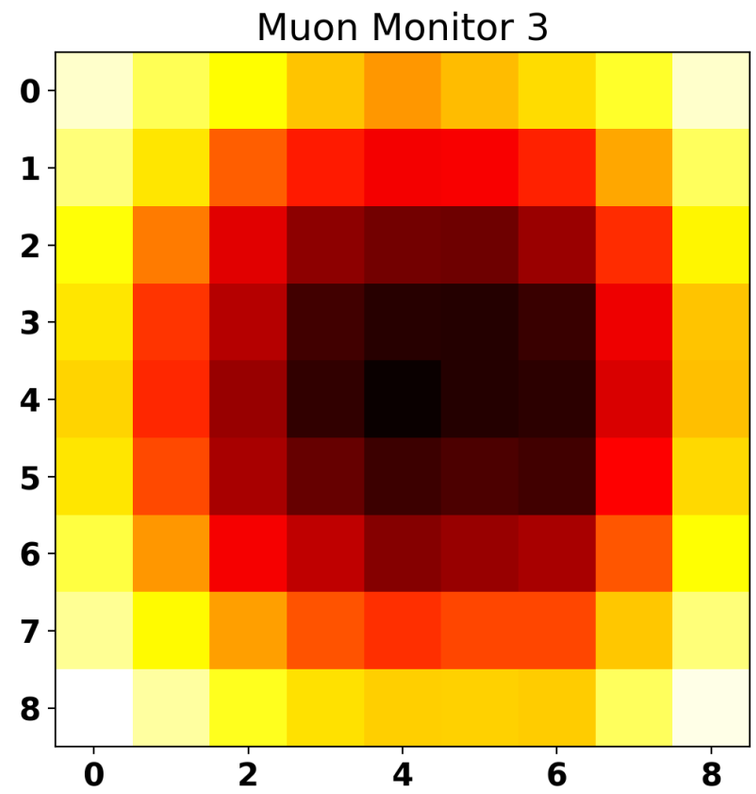
VP121	0	12-MAR-2019	00:00:00.649	-1.012	-0.9954	-0.9817	-0.9734	-0.9884	-0.9906
VP121	1	12-MAR-2019	00:00:01.982	-1.009	-1.009	-0.9942	-0.9795	-0.9779	-0.9757
VP121	2	12-MAR-2019	00:00:03.315	-1.069	-1.063	-1.067	-1.053	-1.058	-1.063
VP121	3	12-MAR-2019	00:00:04.649	-1.092	-1.08	-1.077	-1.069	-1.091	-1.068
VP121	4	12-MAR-2019	00:00:05.982	-1.082	-1.084	-1.065	-1.051	-1.046	-1.06
VP121	5	12-MAR-2019	00:00:07.315	-1.039	-1.043	-1.029	-1.019	-1.004	-1.005
VP121	6	12-MAR-2019	00:00:14.180	-1.064	-1.059	-1.049	-1.047	-1.051	-1.036
VP121	7	12-MAR-2019	00:00:15.513	-1.012	-1.009	-1.015	-0.9964	-0.9887	-0.9915
VP121	8	12-MAR-2019	00:00:16.846	-1.109	-1.111	-1.102	-1.111	-1.119	-1.115
VP121	9	12-MAR-2019	00:00:18.179	-1.024	-1.023	-1.017	-1.014	-0.9978	-1
VP121	10	12-MAR-2019	00:00:19.512	-1.088	-1.093	-1.099	-1.088	-1.075	-1.076
VP121	11	12-MAR-2019	00:00:20.845	-0.9578	-0.9549	-0.9406	-0.9333	-0.9289	-0.9266
VP121	12	12-MAR-2019	00:00:22.177	-1.072	-1.063	-1.062	-1.053	-1.062	-1.062
VP121	13	12-MAR-2019	00:00:23.510	-1.027	-1.012	-1.004	-1.002	-1.026	-1.01
VP121	14	12-MAR-2019	00:00:24.843	-1.071	-1.065	-1.078	-1.067	-1.058	-1.046
VP121	15	12-MAR-2019	00:00:26.176	-1.044	-1.039	-1.04	-1.036	-1.021	-1.015
VP121	16	12-MAR-2019	00:00:27.509	-0.9618	-0.9483	-0.9709	-0.9609	-0.9689	-0.9469
VP121	17	12-MAR-2019	00:00:28.842	-1.003	-1.011	-1.011	-1.004	-0.998	-0.9872

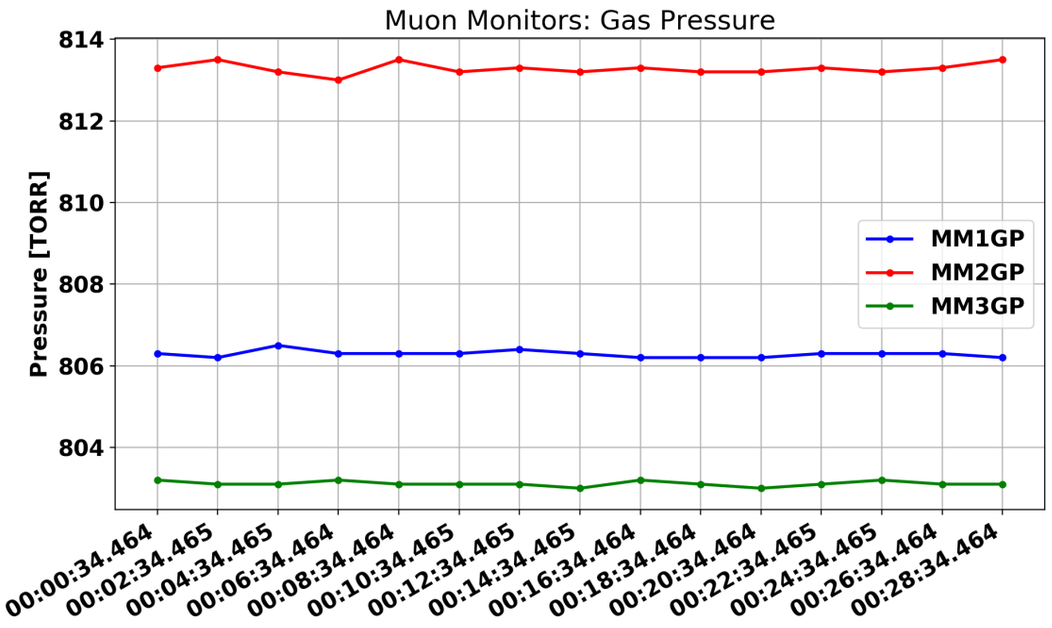
Seems it’s recording data as we expected

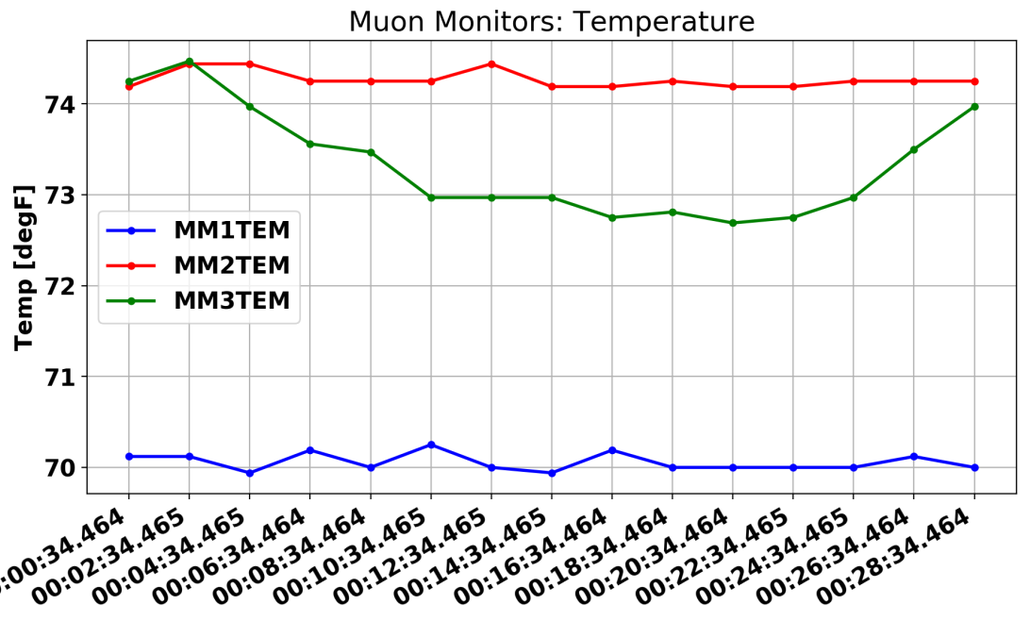
QA Plots











Fermilab

Useful information of extracting IF beam data

http://dbweb5.fnal.gov:8080/ifbeam/app/event_monitor

IF Beam Data Server

Home | Data Access | Data Browser | Dashboard | Event Monitor | A9 Monitor | Device Monitor | System Status | Bundles | NuMi Charts | BNB Charts | G-2 Charts | Admins | Login

Auto-refresh

Collectors Status

Event	Timestamp	Interval
e,86	Wed Mar 13 2019 11:25:10 GMT-0500 (CDT) (3d 22h sec ago)	1.333
e,a9	Wed Mar 13 2019 11:25:10 GMT-0500 (CDT) (4h 52m sec ago)	10.001
e,1d	Wed Mar 13 2019 11:25:10 GMT-0500 (CDT) (1.08s sec ago)	0.067
p,60000	Wed Mar 13 2019 11:25:10 GMT-0500 (CDT) (53.67s sec ago)	60.000
p,5000	Wed Mar 13 2019 11:25:10 GMT-0500 (CDT) (0.82s sec ago)	4.999
p,900000	Wed Mar 13 2019 11:25:10 GMT-0500 (CDT) (1m 20s sec ago)	809.269
e,8f	Wed Mar 13 2019 11:25:10 GMT-0500 (CDT) (0.66s sec ago)	1.000
z,bnbmw	Wed Mar 13 2019 11:25:10 GMT-0500 (CDT) (1.47s sec ago)	0.041
e,00	Wed Mar 13 2019 11:25:10 GMT-0500 (CDT) (14.02s sec ago)	60.004
e,36	Wed Mar 13 2019 11:25:10 GMT-0500 (CDT) (5.41s sec ago)	0.003
e,35	Wed Mar 13 2019 11:25:10 GMT-0500 (CDT) (7.52s sec ago)	0.001

Host	Collector	Last Updated	State	PID
ifbcollectorgpvm02.fnal.gov	collect.gm2_no_ics	03/13/2019 11:24:45 AM	Running	22635
ifbcollectorgpvm02.fnal.gov	collect.NuMI_Monitoring	03/13/2019 11:24:45 AM	Running	3017
ifbcollectorgpvm02.fnal.gov	collect.BoosterNeutrinoBeam	03/13/2019 11:24:45 AM	Running	22637
ifbcollectorgpvm02.fnal.gov	collect.NuMI_Physics	03/13/2019 11:24:45 AM	Running	3021

If you want to access past data, please visit the bundles and get the bundle name

Useful information of extracting IF beam data

IF Beam Data Server

Home | Data Access | Data Browser | Dashboard | Event Monitor | A9 Monitor | Device Monitor | System Status | Bundles | NuMi Charts | BNB Charts | G-2 Charts | Admins | Login

Bundles

View History

Bundle Name: History

Bundle Name	Event	Device Count	Last Update	Group	Collectable
DUNE_CERN_DATA	z,pdune	168	vittone 11/06/2017	DUNE	no
DUNE_CERN_NORTH	z,pdune	104	podstvkv 07/18/2018	DUNE	no
DUNE_CERN_SEP2018	z,pdune	304	podstvkv 02/11/2019	DUNE	no
DUNE_CERN_SEP2018_AUX	z,pdune	93	vittone 11/01/2018	DUNE	no
DUNE_CERN_SEP2018_PROF	z,pdune	176	vittone 11/01/2018	DUNE	no
DUNE_CERN_SEP2018_TIMBER	z,pdune	8	podstvkv 02/13/2019	DUNE	no
DUNE_CERN_SEP2018_TOF	z,pdune	35	vittone 11/01/2018	DUNE	no
mvi_DUNE_CERN_SEP2018	z,pdune	304	vittone 11/01/2018	DUNE	no
gm2_ics	e,86	5	vittone 06/30/2017	Gm2	no
gm2_no_ics	e,86	17	gohn 06/30/2017	Gm2	no
MCenter_EndSpill	e,36	56	badgett 06/23/2015	MCenter	no
MCenter_MidSpill	e,00,e,4000	116	randy 03/11/2016	MCenter	no
MCenter_MidSpill_35	e,35	116	badgett 04/12/2016	MCenter	no
NobleDetectorGasAnalyzer	p,60000	12	edniner 11/09/2016	NobleDetector	no
A9_Monitoring	e,8f	2	Unknown 10/21/2013	NuMI	no
A9_presence	e,a9	6	Unknown 08/30/2013	NuMI	no
NuMI_all	e,a9	629	Unknown 10/14/2013	NuMI	no

The top table has a list of bundles created by different experiments and users for there purposes. If we want, we can create our own bundle for our purposes!

NuMI_all has most of the variables

Need to beware about deleting the bundle by the owner or creator !!

Therefore, scroll done to the next table :

Fermilab

Useful information of extracting IF beam data

BoosterNeutrinoBeam_read	e,1d	24	zarko 08/22/2017	uBooNe	no
LArTFTimers	p,900000	25	podstvkv 12/15/2016	uBooNe	no
MBTest	p,3000	9	Unknown 12/19/2011	uBooNe	no

Bundle Name	Event	Device Count	Last Update	Group	Collectable	Storage	UDP	Host
collect.A9_Monitoring	e,8f	3	podstvkv 10/02/2015	root	yes	long	no	☑ dbweb5.fnal.gov ☐ dbweb6.fnal.gov ☑ ifbcollectorgpvm01.fnal.gov ☑ ifbcollectorgpvm02.fnal.gov
collect.BNBShortTerm	e,1d,e,40	96	vittone 04/20/2016	root	yes	short	yes	☑ dbweb5.fnal.gov ☐ dbweb6.fnal.gov ☑ ifbcollectorgpvm01.fnal.gov ☑ ifbcollectorgpvm02.fnal.gov
collect.BoosterNeutrinoBeam	e,1d,e,40	48	vittone 09/29/2017	root	yes	long	yes	☑ dbweb5.fnal.gov ☐ dbweb6.fnal.gov ☑ ifbcollectorgpvm01.fnal.gov ☑ ifbcollectorgpvm02.fnal.gov
collect.DUNE_Muon_Test	e,a9,e,500	18	podstvkv 04/08/2016	root	yes	long	no	☑ dbweb5.fnal.gov ☐ dbweb6.fnal.gov ☑ ifbcollectorgpvm01.fnal.gov ☑ ifbcollectorgpvm02.fnal.gov
collect.gm2_ics	e,86,e,5000	5	vittone 06/29/2017	root	yes	long	no	☑ dbweb5.fnal.gov ☐ dbweb6.fnal.gov ☑ ifbcollectorgpvm01.fnal.gov ☑ ifbcollectorgpvm02.fnal.gov
collect.gm2_no_ics	e,86							☑ dbweb5.fnal.gov
collect.Helium	p,60000							
collect.NuMI_Monitoring	e,a9,e,500	486	vittone 07/12/2016	root	yes	short	no	☑ dbweb5.fnal.gov ☐ dbweb6.fnal.gov ☑ ifbcollectorgpvm01.fnal.gov ☑ ifbcollectorgpvm02.fnal.gov
collect.NuMI_Monitoring_8F	e,8f	481	vittone 06/19/2014	root	yes	short	no	
collect.NuMI_Physics	e,a9,e,500	106	vittone 07/12/2016	root	yes	long	yes	☑ dbweb5.fnal.gov ☐ dbweb6.fnal.gov ☑ ifbcollectorgpvm01.fnal.gov ☑ ifbcollectorgpvm02.fnal.gov
collect.NuMI_Physics_1Hz	e,8f	40	podstvkv 10/02/2015	root	yes	short	yes	☑ dbweb5.fnal.gov ☐ dbweb6.fnal.gov ☑ ifbcollectorgpvm01.fnal.gov ☑ ifbcollectorgpvm02.fnal.gov
								☑ dbweb5.fnal.gov

The bottom table has a list of bundles created for experiments keeping data for “short” and “long” terms

Here we can see all muon and hadron monitor data for several years.

Useful information of extracting IF beam data

To access data define your time intervals, event type and bundle name according to this examples.

IF Beam Data Server

IFBeam DB Home | Data Server

Data retrieval

Single device:
http://dbdata1vm.fnal.gov:9080/ifbeam/data//data?v=device[&e=event][&t=time][&f=data-format]
Bundle:
http://dbdata1vm.fnal.gov:9080/ifbeam/data//data?b=bundle_name[&t=time]

Time format: yyyy-mm-ddThh:mm:ss.ssssss. Default is most recent event or measurement.
Data format is optional, can be either tsv (tab separated values) or xml. Default is xml.
Event is optional. If unspecified, will return the closest measurement for the device to the requested time.

Examples:

Array:
http://dbdata1vm.fnal.gov:9080/ifbeam/data//data?v=E:TOR101&e=e,a9&t=2011-09-15T15:55:52.538&f=xml
Most recent wind speed:
http://dbdata1vm.fnal.gov:9080/ifbeam/data//data?v=m:blow&e=p,5000
Bundle:
http://dbdata1vm.fnal.gov:9080/ifbeam/data//data?b=NuMI_Physics_A9
Bundle for time interval:
http://dbdata1vm.fnal.gov:9080/ifbeam/data//data?b=NuMI_Physics_A9&t0=2012-11-11T11:11:11-05:00&t1=2012-11-11T12:12:12-05:00
JSON Data Source for Google Charts:
http://dbdata1vm.fnal.gov:9080/ifbeam/data//data?v=E:TOR101&e=e,a9&t0=-11h&t1=-10h&bin=5&f=json

Useful information of extracting IF beam data

http://ifb-data.fnal.gov:8100/ifbeam/data/data?b=NuMI_all&t0=2018-02-10T15:30:00&t1=2018-02-10T15:30:10&f=csv


```
timestamp,name,units,value(s)
1518293100042,E:HRNDIR,V,745.315551758
1518293100042,E:TGTPWR,kW,550.923339844
1518293100043,E:BAFT1,degC,60.2172851562
1518293100043,E:BAFT2,degC,62.2497558594
1518293100043,E:HADMDS[],,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0
,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,
0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,-0.11474959563,0.00122074037904,0.00183111056856,0.00122074037904,-0.00030518509476,0.0015259254738,-0.00061037018952,0.00061
037018952,0.00183111056856,-0.00061037018952,-0.00061037018952,0.00244148075808,0.00030518509476,-0.00030518509476,0.00091555528428,0.0,0.00183111056856,-0.00061037018952,0.0015259254738,0.
0015259254738,0.0,-0.00091555528428,0.00213629566332,-0.00030518509476,0.00061037018952,0.00061037018952,0.00030518509476,0.0,0.0015259254738,0.0,0.00213629566332,-0.00061037018952,0.001220
74037904,0.0,0.00030518509476,0.00061037018952,0.00030518509476,0.0,0.00183111056856,0.00183111056856,0.0015259254738,0.00061037018952,-0.00122074037904,0.00061037018952,0.00030518509476,-0
.00030518509476,0.00183111056856,0.00030518509476,-2.76985992004,-2.73445844905,-2.92886135441,-2.93710135197,-2.75429548021,-2.71706289865,-2.65449995422,-2.51930295724,-2.72804956206,-0.2
60017700735,-3.07046723838,-2.87392803735,-2.66121402631,-2.62245551927,-2.86996063112,-3.48918118839,-3.80932035279,-4.62324900052,-3.78276924955,-3.3954893643,-2.90200506607,-2.4271370586
3,-2.78817102573,-0.255134739219,-6.15222632527,-3.70921964171,-0.0045777764214,-2.47413556322,-2.8653828547,-3.21787163915,-3.67748039186,-4.31196020386,-3.6982329783,-0.352793969543,-0.65
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,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.00122074037904,0.00091555528428,0.00061037018952,0.001
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,0.00091555528428,0.0015259254738,0.00030518509476,0.0015259254738,-0.00030518509476,0.00091555528428,-0.00122074037904,0.0,0.00091555528428,0.00061037018952,-0.00061037018952,0.00152592547
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1518293100043,E:HITGT[],sum,214.327789307,196.909637451,212.615615845,217.577133179,211.925521851,209.521148682,219.99949646
1518293100043,E:HMGPR,TORR,670.625
1518293100043,E:HMHV1,Volt,-69.875
1518293100043,E:HMHV2,Volt,-70.3125
1518293100043,E:HMHV3,Volt,-42.8125
1518293100043,E:HMHV4,Volt,-31.5
1518293100043,E:HMRTD,DegF,0.09375
1518293100043,E:HP101[],mm,-0.75287181139,-0.528697133064,-0.674501180649,-0.840884506702,-0.677865743637,-0.71968960762,-0.851418077946
1518293100043,E:HP102[],mm,3.33672142029,2.75702929497,3.29270648956,3.38022184372,3.25721263885,3.19607567787,3.55739021301
1518293100043,E:HP104[],mm,-0.0448760092258,0.32197996974,0.163235723972,-0.08465975523,-0.0771717131138,-0.0863401591778,-0.13944414258
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1518293100043,E:HP114[],mm,-0.0110192969441,0.316742062569,0.0105489194393,0.0149811804295,0.00189529359341,-0.0564722344279,-0.026049643755
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1518293100043,E:HPTGT[],mm,-0.529298424721,-1.26405096054,-0.788499295712,-0.504469811916,-0.416714608669,-0.495039671659,-0.441768884659
1518293100043,E:MM1CNT,,70.3372295297
1518293100043,E:MM1GF,L/hr,27.06
```


That's it! :)

Future plans:

- **Have to implement most important variables in to the DB**
  - » **Ex: Separated data tables for different calibrations**
  - » **Signal gain table**
- **Need to move from pickle to hdf5 format:**
  - » **HDF5 binary format has more flexibility to handle with C/C++ , Matlab, Mathematica, Python … etc**
  - » **Fast extractions**
- **Will setup a recovery folder to keep data for 1 year**
- **Have to update user's data extraction script with adding several options**
- **Need to setup automated QA plots for DB management**
- **Have to setup an automated summary report for data quality checks**
- **<Add your thought here>**

There are a lot of fun things to add in the future !!

THANK YOU!