



# ***GSI Data Set for the electronic apparatus***



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# ***GSI Data location:***

- Copies of the RAW data taken at GSI are present at:
  - GSI LUSTRE dir: [/lustre/nyx/bio/asarti/FOOT/data/](#)
  - TIER3 [/gpfs\\_data/local/foot/DataGSI/](#)
- All the streams for each RUN

## ***Daq:***

data\_test.00002212.physics\_foot.daq.RAW.\_lb0000.\_EB-RCD.\_0001.data

## ***WD:***

run\_wd\_00002212.data

## ***VTX:***

run\_vtx\_00002212.data

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  - GSI LUSTRE dir: [/lustre/nyx/bio/asarti/FOOT/data/](#)
  - TIER3 [/gpfs\\_data/local/foot/DataGSI/](#)
- All the streams for each RUN

## Daq:

`data_test.00002212.physics_foot.daq.RAW._lb0000._EB-RCD._0001.data`

## WD:

`run_wd_00002212.data`

## VTX:

`run_vtx_00002212.data`

For VTX are available also .ZS file of local stream

- TXT file before intermediate PC group together the 4 sensors data in `run_vtx_*.data` binary

# Documentation:

<http://arpg-serv.ing2.uniroma1.it/elog/FOOTGsi2019/>

*elog*



NAME	RUNNUMBER	STARTAT	DURATION	CREATEDBY
tdaq	2210	20190407T164112	126	tdaq
tdaq	2211	20190407T164358	350	tdaq
tdaq	2212	20190407T165036	626	tdaq

NAME	RUNNUMBER	STARTAT	DURATION	CREATEDBY
tdaq	2238	20190408T171318	70	tdaq
tdaq	2239	20190408T171623	161	tdaq
tdaq	2240	20190408T172000	157	tdaq
tdaq	2241	20190408T172314	153	tdaq
tdaq	2242	20190408T173721	1425	tdaq

**DAQ database**

**PRIVATE**

MySQL query to retrieve run info: start, duration...

Automatically generated by DAQ.

Useful to match the VTX .ZS file of local stream with global RUNS

## **RUNS:**

- 14 in total for 504 MB (daq) + 223 MB(vtx)+8726 MB (wd):
- **7 April** – no target – first DAQ runs with beams – changing detector conditions...
  - 2197 (BM only), 2199 (BM, VTX), 2200 (BM, VTX),
  - tests: 2202 (BM, WD, VTX), 2203 (BM, WD), 2204 (BM, WD,), 2205 (BM, WD, fragm. Trigger),
  - **All good, no target**, VTX thresholds low, BM HV nominal: **2210, 2211, 2212** (+2209 no beam, 58k)
- **8 April** – BM HV & TOF scans
  - BM HV scans, with target & high VTX thresholds: **2239, 2240, 2241**
  - TOF scan: **2242**
- **9 April** 6 kevents of beam before acceleretor breaks: **2251**

# Event Matching:

Table of matching

Lost or unmatched events

DAQ			WD				VTX			
Evt	HW	BCO	prog	Evt	HW	BCO	prog	Evt	HW	Framecounter
0	0	3052	1	1	2	103039	0	0	1	26809186
1	1	6632	2	2	3	106619	1	1	2	26809205
2	2	42219	3	3	4	142205	2	2	3	26809397
3	3	52508	4	4	5	152494	3	3	4	26809453
4	4	57841	5	5	6	157828	4	4	5	26809481
5	5	80224	6	6	7	180211	5	5	6	26809602
6	6	83582	7	7	8	183569	6	6	7	26809620
7	7	96432	8	8	9	196419	7	7	8	26809689
8	8	116822	9	9	10	216809	-1	-1	-1	-1
9	9	136556	10	10	11	236542	9	9	10	26809905
10	10	142837	-1	-1	-1	-1	10	10	11	26809939

13227	13227	77716341	-1	-1	-1	-1	11829	11734	11735	27227901
13228	13228	77719786	12992	12992	13230	53112701	-1	-1	-1	-1
13229	13229	77722826	12993	12993	13231	53115741	11831	11736	11737	27198465
13230	13230	77725486	12994	12994	13232	53118401	11832	11737	11738	27227950
13231	13231	77728620	-1	-1	-1	-1	11833	11738	11739	27227967
13232	13232	77731452	12995	12995	13234	53124366	11834	11739	11740	27227982
13233	13233	77734076	12996	12996	13235	53126991	11835	11740	11741	27227996
13234	13234	77737197	12997	12997	13236	53130112	11836	11741	11742	27228013

- File of the WD and VTX are rewritten in the matched order
- If the event is missing or not possible to match is left empty

# Event Building:

- The new matched data stream of WD and VTX are build into the global DAQ file.

```
|10 02 00 00 aa 34 12 aa 84 00 00 00 18 00 00 00
00 00 00 05 39 00 46 00 01 00 00 00 00 00 00 00
00 00 00 00 6c 2a aa 5c 30 c7 fc 2e 00 00 00 00
00 00 00 00 0f 00 00 00 a4 08 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
6c 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 dd 34 12 dd 40 00 00 00 0a 00 00 00
00 00 00 05 30 00 46 00 03 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 ee 34 12 ee
09 00 00 00 00 00 01 03 30 52 46 00 a4 08 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
30 31 46 00 2d 2a aa 5c 26 e8 04 00 00 00 00 00
1f 00 00 40 99 0f 00 08 10 05 20 00 7d 05 40 00
0b 05 80 00 21 05 c8 00 0f 06 08 00 79 05 48 00
da 06 a0 00 23 05 e0 00 a7 05 68 00 4c 07 80 00
54 0e 50 00 f4 08 98 00 e7 0a a0 00 49 0e b0 00
10 00 00 18 99 0f 00 09 e1 09 10 01 17 14 78 01
ec 0b 10 01 05 00 00 19 ff 02 00 80 44 00 00 44
30 30 46 00 2d 2a aa 5c 33 ed 04 00 00 00 00 00
cc cc 32 00 d5 f3 32 00 d3 f3 32 00 00 00 00 00
71 82 00 00 3c 00 00 00 e0 00 00 00 33 33 33 33
00 00 00 00 00 00 00 00 02 00 00 00 28 00 00 00
01 00 00 00 dd 34 12 dd 2c 00 00 00 0a 00 00 00
00 00 00 05 33 00 46 00 03 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 ee 34 12 ee
09 00 00 00 00 00 01 03 31 52 46 00 a4 08 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
30 32 46 00 3c 2a aa 5c 2e 8a 05 00 00 00 00 00
34 12 34 12 00 00 00 00 30 33 46 00 3c 2a aa 5c
2e 8a 05 00 00 00 00 00 34 12 34 12 00 00 00 00
33 38 46 00 3c 2a aa 5c 2e 8a 05 00 01 00 00 00
00 00 00 00 44 55 44 55 22 22 22 22 03 00 00 00
03 00 00 00 00 00 00 00 03 00 00 00 13 00 00 00
01 00 00 00 cc cc 34 12 04 00 00 00 02 00 00 00
```

Beam monitor

WD fragment

VTX fragment

- WD and VTX fragments of the original DAQ file are replaced with the info from the dedicated streams if not empty.

# Build and Matched data Files:

- WD = Daq + WD

- VTX = Daq + WD + VTX

● Build data after matching, significant run are in:

- TIER3 /gpfs\_data/local/foot/DataGSI\_match/

```
ridolfi    foot-t3    463002356 16 mag 10.06 data_built.2210.physics_foot.daq.VTX.1.dat
ridolfi    foot-t3    450933588 16 mag 10.06 data_built.2210.physics_foot.daq.WD.1.dat
ridolfi    foot-t3    858967504 16 mag 10.06 data_built.2211.physics_foot.daq.VTX.1.dat
ridolfi    foot-t3    820709756 16 mag 10.06 data_built.2211.physics_foot.daq.WD.1.dat
ridolfi    foot-t3    1342061484 16 mag 10.06 data_built.2212.physics_foot.daq.VTX.1.dat
ridolfi    foot-t3    1268538500 16 mag 10.06 data_built.2212.physics_foot.daq.WD.1.dat
ridolfi    foot-t3    480357312 16 mag 10.06 data_built.2239.physics_foot.daq.VTX.1.dat
ridolfi    foot-t3    480087736 16 mag 10.06 data_built.2239.physics_foot.daq.WD.1.dat
ridolfi    foot-t3    473935852 16 mag 10.06 data_built.2240.physics_foot.daq.VTX.1.dat
ridolfi    foot-t3    473519552 16 mag 10.07 data_built.2240.physics_foot.daq.WD.1.dat
ridolfi    foot-t3    474626564 16 mag 10.22 data_built.2241.physics_foot.daq.VTX.1.dat
ridolfi    foot-t3    2539358160 16 mag 10.07 data_built.2242.physics_foot.daq.VTX.1.dat
ridolfi    foot-t3    2538350252 16 mag 10.07 data_built.2242.physics_foot.daq.WD.1.dat
```

● First attempt on matching event, if new file will be available, old file will be replaced and stored in a different directory and documented.



# Decoded match files:

- SHOE Root files output of the match data are in:
  - TIER3 /gpfs\_data/local/foot/DataGSI\_match/

```
rw-r--r-- 1 ridolfi    foot-t3    34425826 16 mag 10.03 run_2210_match_20k.root
rw-r--r-- 1 ridolfi    foot-t3    78715475 16 mag 10.03 run_2211_match_60k.root
rw-r--r-- 1 amengarelli foot-t3    129097904 16 mag 09.42 run_2212_match_160k.root
rw-r--r-- 1 ridolfi    foot-t3    13597001 16 mag 10.03 run_2239_match_20k.root
rw-r--r-- 1 ridolfi    foot-t3    17684267 16 mag 10.03 run_2240_match_20k.root
rw-r--r-- 1 amengarelli foot-t3    27046790 16 mag 14.50 run_2241_match_20k.root
rw-r--r-- 1 ridolfi    foot-t3    129463113 16 mag 10.03 run_2242_match_200k.root
rw-r--r-- 1 ridolfi    foot-t3     9149699 29 mag 12.08 run_2251_match_6k.root
```

- Produced RUNNING:

DecodeRaw -in

/gpfs\_data/local/foot/DataGSI\_match/data\_built.2211.physics\_foot.daq.VTX.1.dat -out  
run\_2211\_match\_20k.root -his -ntu -trk (-nev 20000)

- Root files contain for all events: control plots, quantities after tracking and reconstruction by SHOE stored in a tree

# Flat Ntuple production from SHOE tree

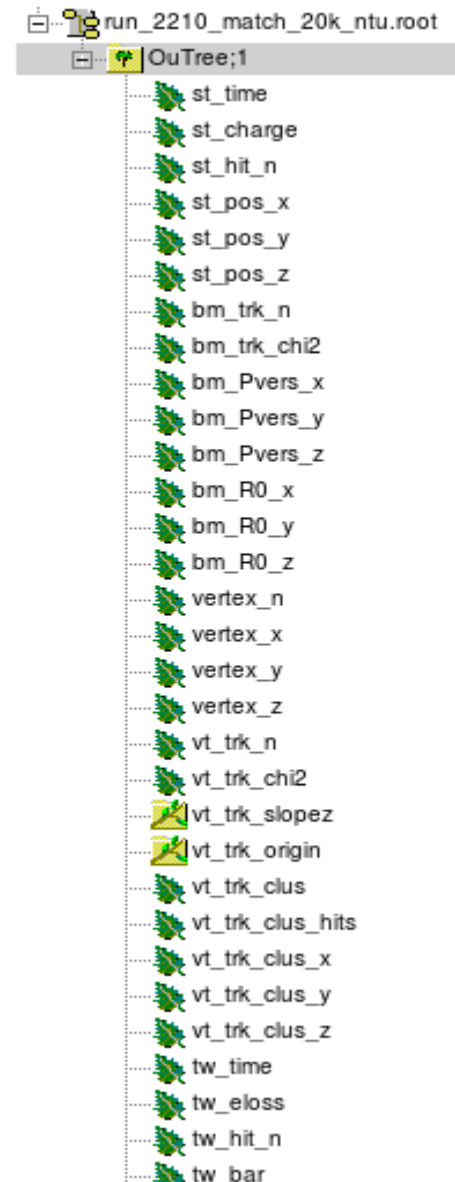
- Printout a flat and light ntuple for fast analysis outside SHOE framework

**ON GIT**

[https://baltig.infn.it/asarti/shoe/blob/newgeom\\_v1.0/Reconstruction/fullrec/macros/PrintFlatNtupleRaw.C](https://baltig.infn.it/asarti/shoe/blob/newgeom_v1.0/Reconstruction/fullrec/macros/PrintFlatNtupleRaw.C)

Stored in TIER3 /gpfs\_data/local/foot/DataGSI\_ntuple/

- The “OutTree” contains branches with the quantities from the single detector to perform the preliminary analysis in Roberto’s talk



# Summary and Recommendations:

- Copies of the RAW data taken at GSI are available in different places
- The data taking has been documented on official elog (yes...sometimes a posteriori)
  - Additional info on private DAQ database are available
- Event building and matching has been made OFFLINE
  - Files are available **ONLY** @ Tier3 in Bologna



DO NOT USE ANY  
OTHER VERSION

- PLEASE, Look at the files DECODE them... Feedback is really WELCOME

# ***BACKUP SLIDES***

## ***Matched Events per run:***

<b>RUN</b>	<b>DAQ EVT<sub>s</sub></b>	<b>WD EVT<sub>s</sub></b>	<b>VTX Evt<sub>s</sub></b>	<b>WD matched</b>	<b>VTX Matched</b>	<b>WD&amp;VTX matched</b>
2210	20463	15091	19059	15090	19004	13723
2211	62782	26985	61322	26984	61120	25494
2212	116349	41368	114238	41367	113777	39556
2239	20821	15618	10246	15617	448	342
2240	20004	15370	10238	15369	8749	6560
2241	20041	15235	9777	15234	8348	6174
2242	202729	68078	110721	68077	29458	21572