ECAL Alignment 2018: Monitoring

MoCa Meeting
29th August 2018

Tanvi Wamorkar
Northeastern University

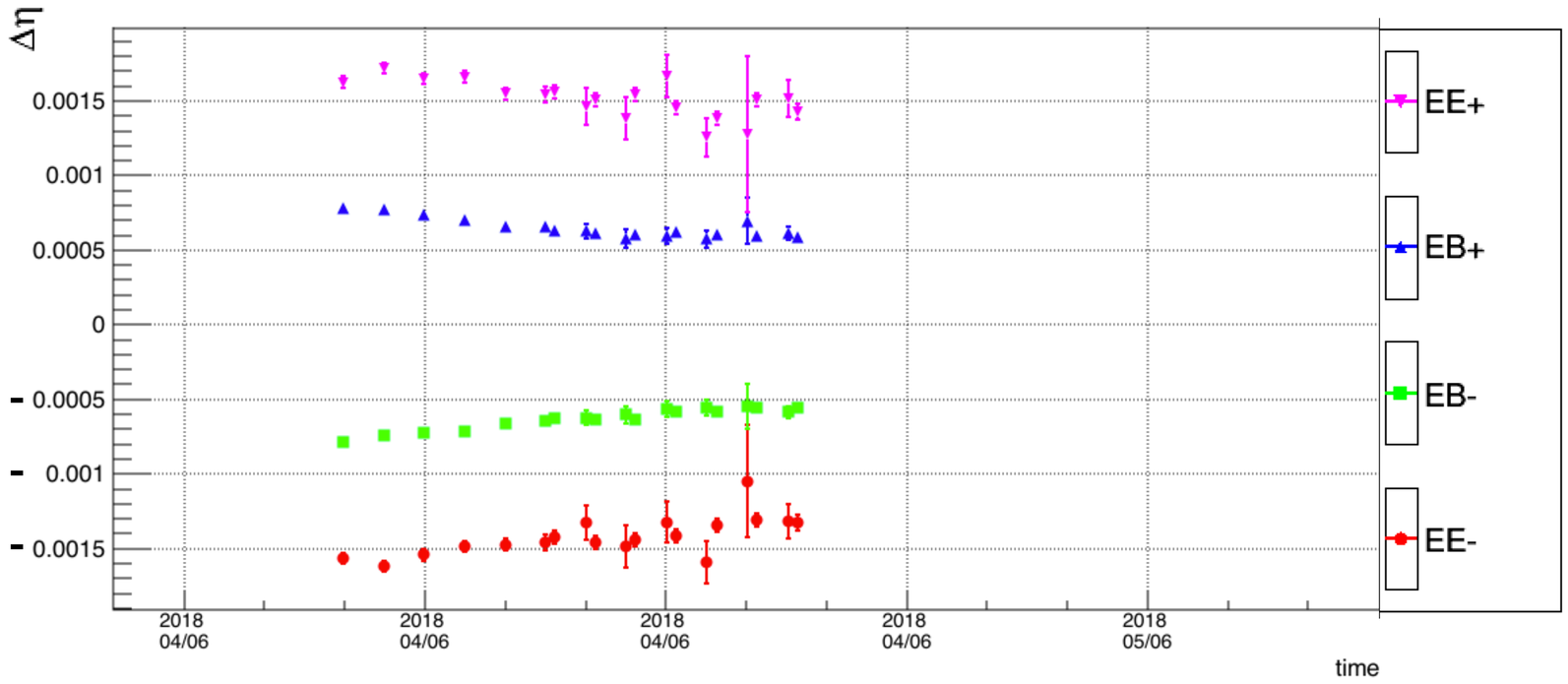
ECAL Alignment Monitoring

- On 22nd August'18, tracker uploaded two alignment objects for testing purposes (derived on representative runs in eras B and C)

- Performed test to check ECAL alignment conditions
- Some details:
  - Global tag: 101X_dataRun2_Prompt_v11
  - Era B:
    - Run #317392
    - Tracker alignment: TrackerAlignment_SummerCamp2018_testRunB
  - Era C:
    - Run #319579
    - Tracker alignment: TrackerAlignment_SummerCamp2018_testRunC

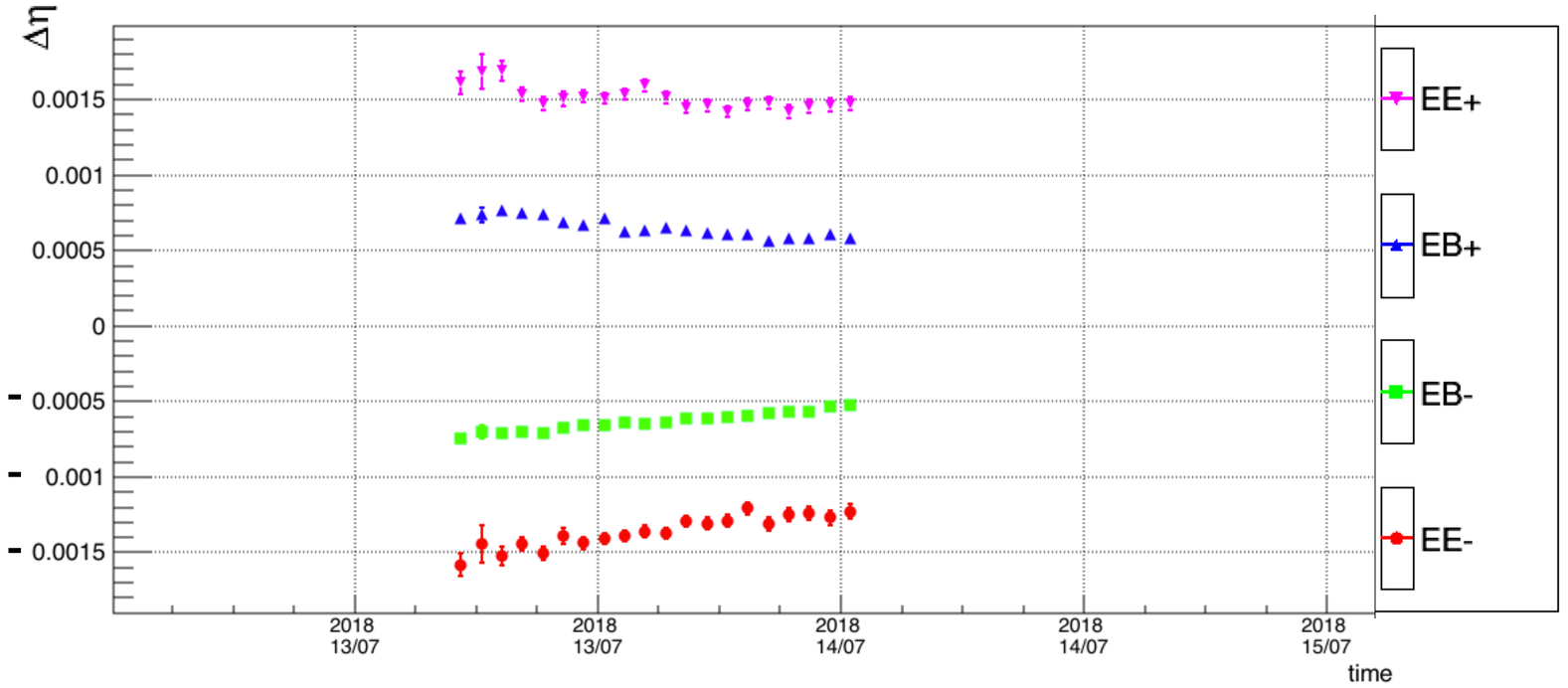
  - Time based pedestals tag: EcalPedestals_timestamp_2018_25July2018_collisions_blue_laser
  - Pulse shape tag: EcalPulseShapes_July2018_rereco_v1

Run #317392



- The small variations do not stabilize on addition of time based pedestals
- Since this was taken from a fill with one single long run, this is the effect of pile-up

Run #319579



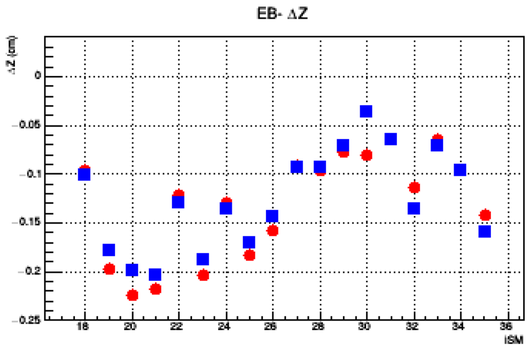
- Similar trend seen in this run as well

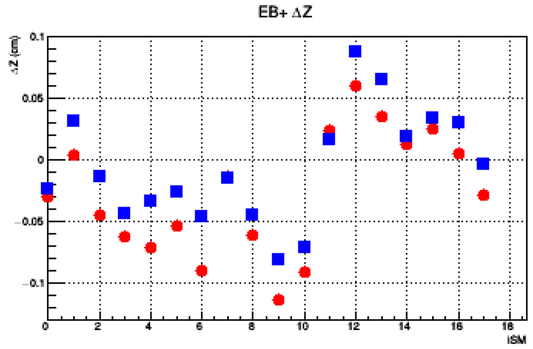
Conclusion

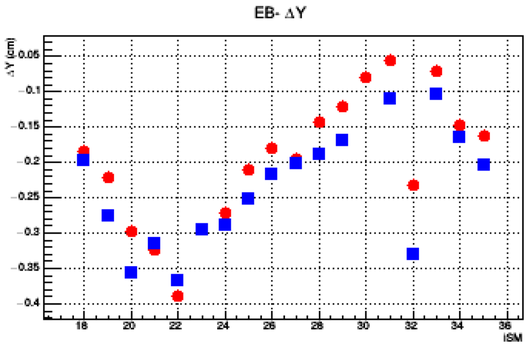
- How to proceed further ?
- Is performing ECAL re-alignment necessary or can we keep the same conditions ?

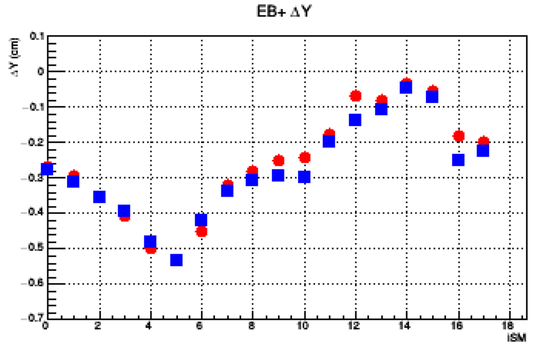
Backup

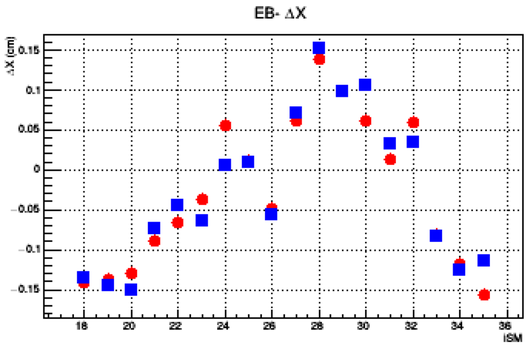
Alignment values : ECAL barrel

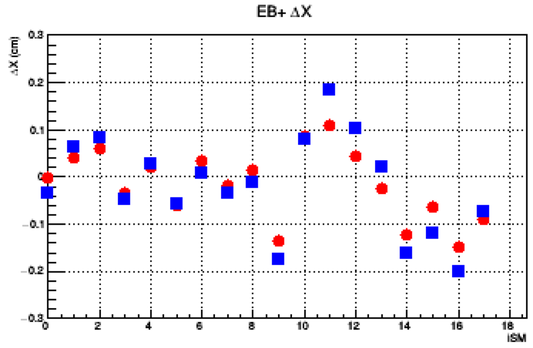












- Δx, Δy, Δz values for EB + and - compared for 2017 and 2018
- On y axis: Supermodule number

- Red circles : 2017 values
- Blue squares : 2018 values
- No significant change observed
  - Expected since during the winter shutdown, only the endcaps were opened and closed

- Alignment values are stored here:

/afs/cern.ch/user/t/twamorka/public/ECALalignment_2018/myEBAlignment_2018_combined_v0.txt

Alignment values : ECAL endcap

		ΔΦ	Δϕ	ΔΨ	Δx	Δy	Δz
EE -	Dee 0	0.00039112	0	0.00039112	-0.065725	-0.53779	-0.63415
	Dee 1	0.00046148	0	0.00046148	-0.03533	-0.64747	-0.46271
EE +	Dee 2	-0.00026845	0	-0.00026845	0.26558	-0.74857	0.43904
	Dee 3	-0.00045037	0	-0.00045037	0.32866	-0.84081	0.41354

2017 values

EE -	Dee 0	0.00039112	0	0.00039112	-0.093372	-0.62537	-0.66182
	Dee 1	0.00046148	0	0.00046148	-0.087034	-0.76022	-0.46897
EE +	Dee 2	-0.00026845	0	-0.00026845	0.07638	-0.79304	0.46977
	Dee 3	-0.00045037	0	-0.00045037	0.12154	-0.8734	0.4397

2018 values

Units are cm

Biggest shift is seen in **y-direction in EE- ~1 mm**
x-direction in EE+ ~2mm

- Alignment values are stored here:

/afs/cern.ch/user/t/twamorka/public/ECALalignment_2018/myEEAlignment_2018_combined_v0.txt