

实验物理中心考核

苑超辰

导师：张华桥

2022.9.2

Outline


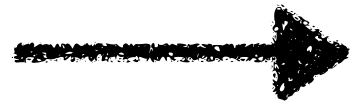
- HGCal sensor test
- Other projects
- Conference
- Summary

HGCal sensor test

Major work:

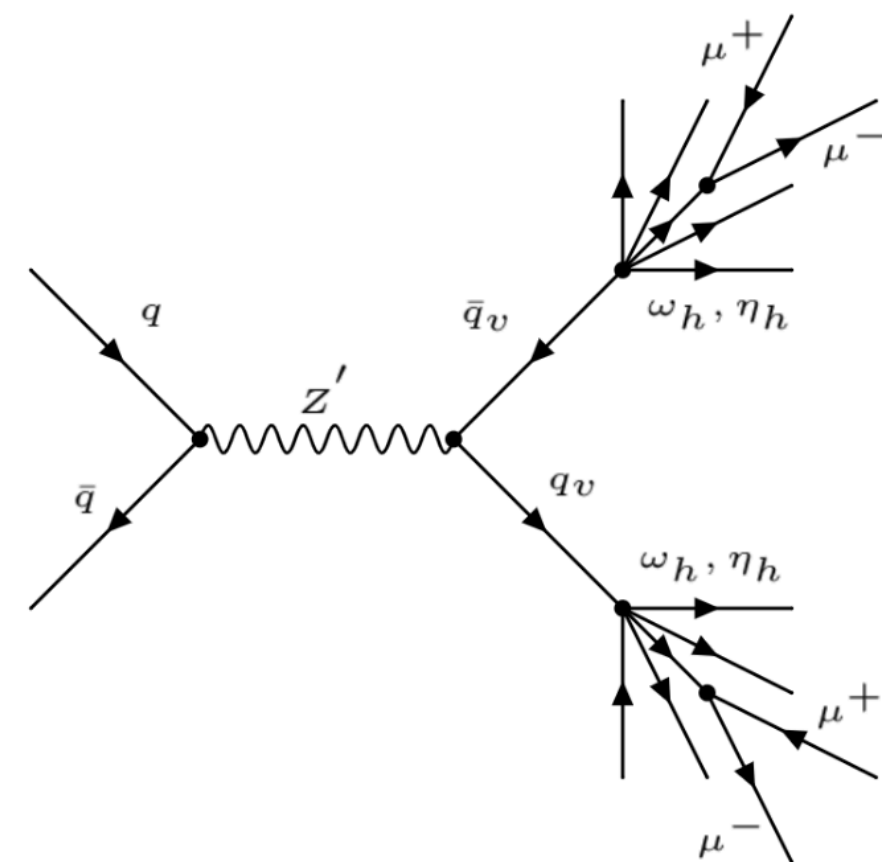
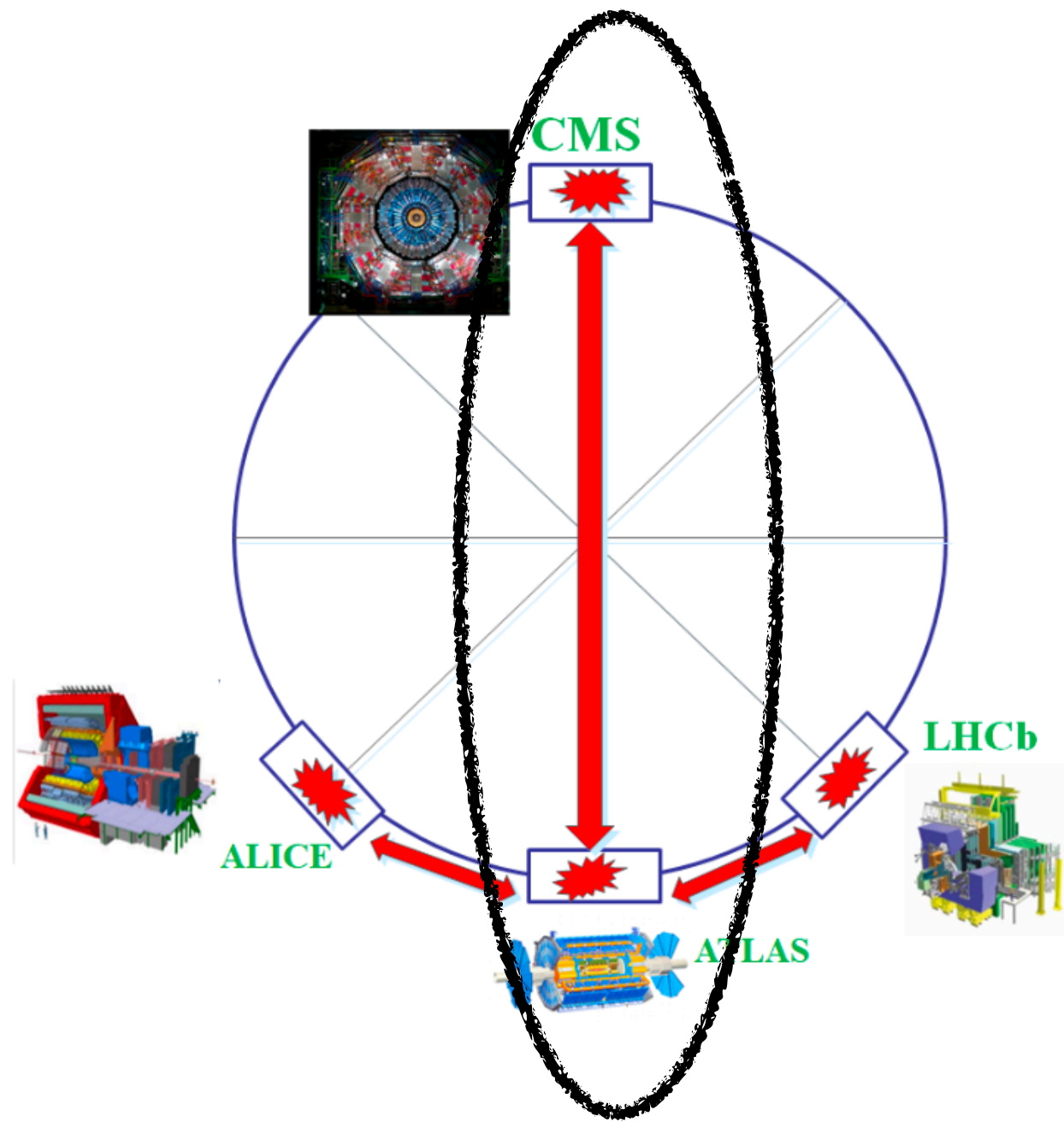
1. Adjust the setup for full sensors test and partials sensors test
2. I-V and C-V measurement
3. Analysis->summarize->present the data
4. Compare the data between CERN and HPK

Major contribution:

1. Summarize all the previous(before pre-series) measurement to a poster and present the poster at ICHEP
2. Taking shifts for sensor measurement -> pre-series sensors done
3. Analysis the data and summarize results for pre-series sensors
4. Huiling and I are taking charge of logistics work  database for sensor test (Still working on)  10 weeks MOB

Delivery	Sensor ID	Scratch pad ID	Thick- ness	Current location sensor	Current location half moons	I_tot_600V <100uA	I_tot_800V < 2.5* I_tot_600V	1) Ncell with I600 > 100nA	2) Ncell with I800 > 2.5 * I600 & I600>10nA threshold I800>25nA & I600<10nA	3) More than 8 bad cells: requirem. 1) and 2)	4) More than two neighbour cells bad: requirem. 1) and 2)
1	N8738_1	100113	300	FSU	CERN	Passed	Passed	0	0	Passed	Passed
1	N8738_2	100114	300	FSU	CERN	Passed	Passed	1	0	Passed	Passed
1	N8738_3	100115	300	UCSB	CERN	Passed	Passed	0	0	Passed	Passed
1	N8738_4	100116	300	UCSB	CERN	Passed	Passed	0	0	Passed	Passed
1	N8738_5	100117	300	UCSB	CERN	Passed	Passed	0	0	Passed	Passed

New searching strategy for LLP



goal: Trigger efficiency

CMS simulation

Simulate the interaction between muons and the earth

Re-generate decay position

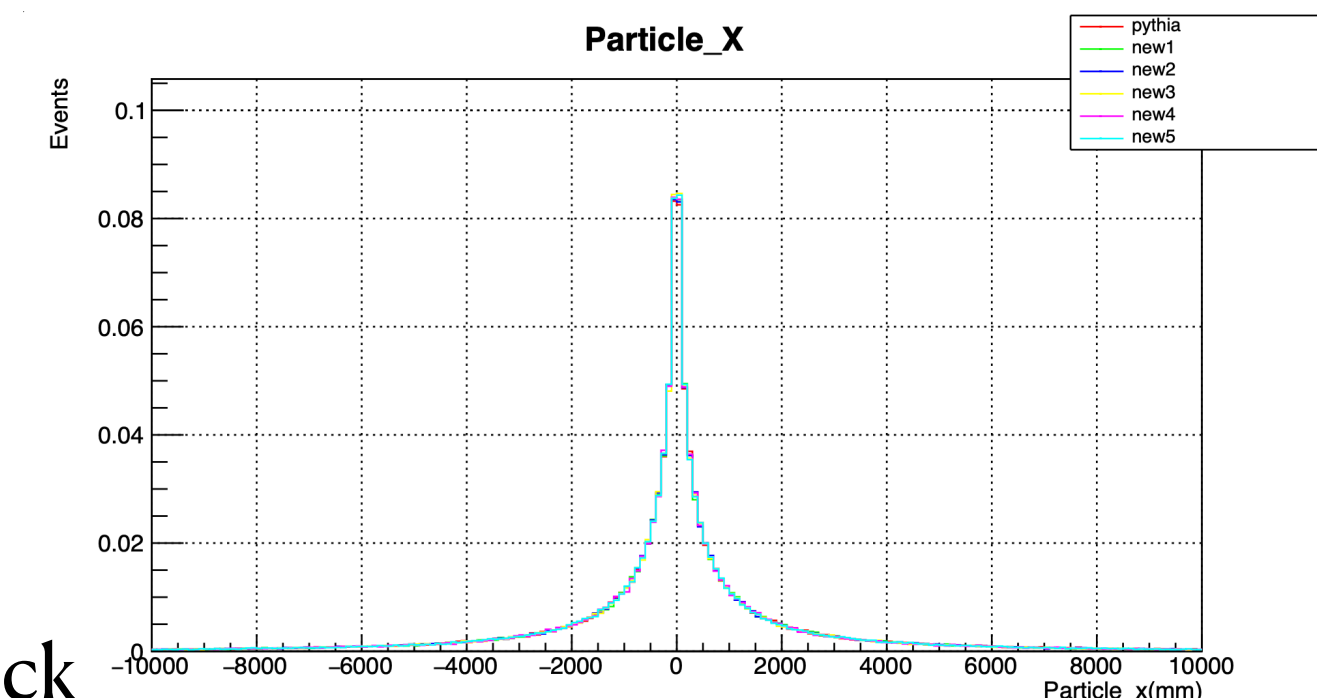
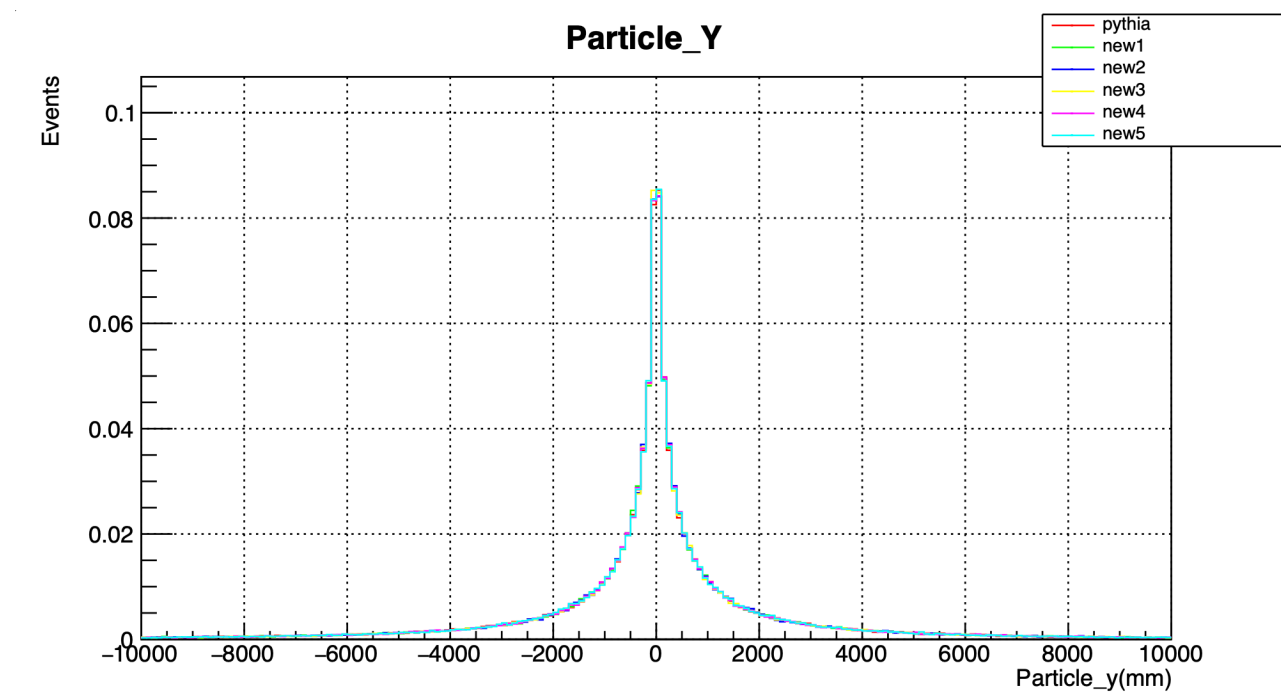
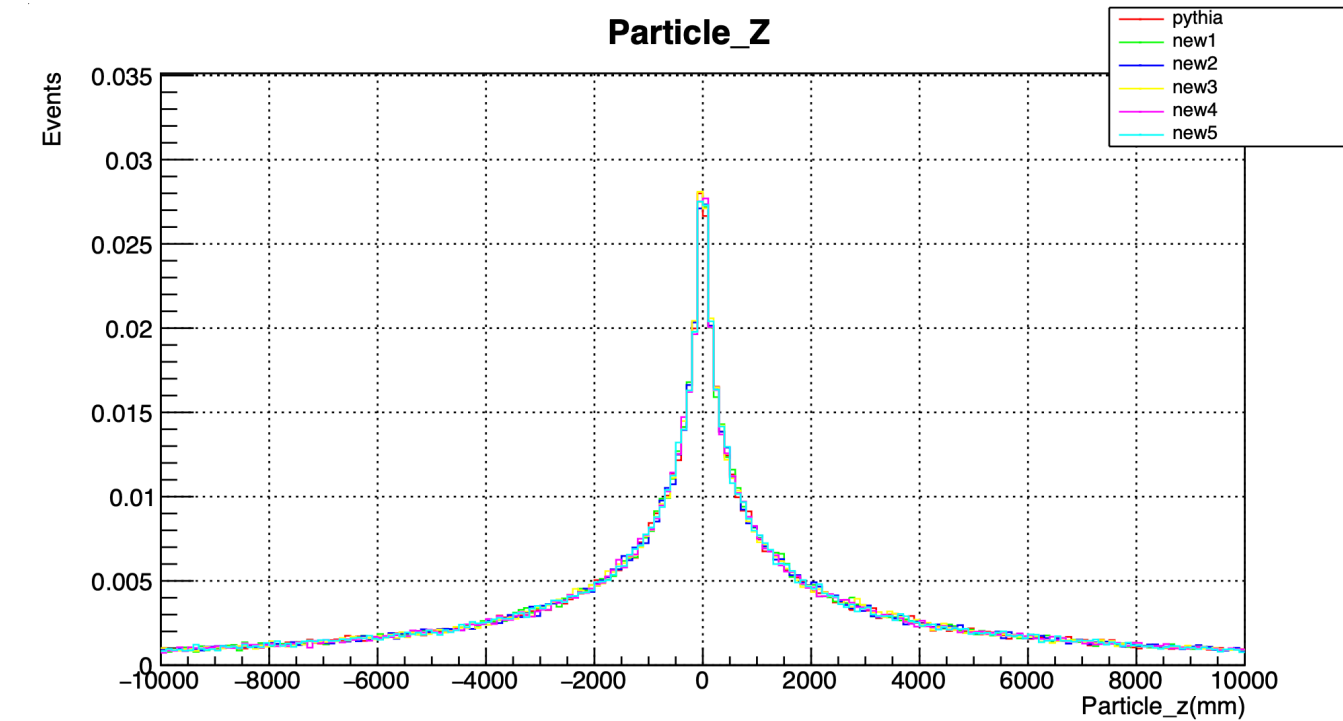
Generate samples

on going talked with EXO convener LLP convener

MUSIC

problem with model talking with gen experts at CERN trying to report to pythia authors

Pythia8+HepMC Need to check



Conference

ICHEP 2022
Poster on behalf of CMS

2022 TeV conference meeting

Measurement of silicon-sensor prototypes for the CMS High-Granularity Calorimeter Upgrade for HL-LHC

Poster given at [ICHEP2022: 41st International Conference on High Energy Physics, 6-13 Jul 2022, Bologna \(Italy\)](#). The poster is selected (cms speaker).

Abstract

Properties of 8" silicon-sensor prototypes for the CMS High Granularity Calorimeter (HGCal) have been studied by measuring the leakage current and depletion voltage, before and after irradiation, at CERN. A semi-automated measurement setup, called PM8, and a fully-automated setup, called ALPS (Automatic Low-temperature Probe Station) have been developed at CERN for this purpose. Similar measurements have also been made at Florida State University (USA).



Sensors with different properties (thickness, oxide quality, pstop...), supplied by Hamamatsu, have been characterized. Some well-behaved sensors were irradiated up to the fluence expected in CMS at the end of HL-LHC, at the Rhode Island Nuclear Science Center (RINSC), and, in addition to the IV/CV behaviours, the annealing behaviour was also studied. The results of this measurement campaign have contributed to the choice of the properties for the ongoing sensor pre-series, which will undergo large-scale testing before launching the full production of nearly 30000 sensors.

Speakers

[Chaochen Yuan \(Inst. of High Energy Physics\)](#)

Measurement of silicon-sensor prototypes for the CMS High-Granularity Calorimeter Upgrade for HL-LHC

Chaochen Yuan on behalf of CMS group



Search for CP violation in $t\bar{t}H$ and tH production in multilepton channel

Chaochen Yuan, Anshul Kapoor, Huaqiao Zhang
IHEP

with contributions from CMS ttH multilepton group

2022.8.10 @2022 中国物理学会高能物理分会 Chaochen Yuan

Summary

- Si sensors measurement at CERN
Measurement for pre-series sensors
Analysis and summarize data for pre-series sensors
Take charge of logistics work and database work with Huiling-> 10 weeks MOB
- LLP new strategy(CMS-ATLAS)
Checking the model with gen experts
- TTH CP analysis
Ready for submission to the arXiv and the journal
- Conference
Poster at ICHEP on behalf of CMS about the measurement for silicon-sensor prototypes
Talk at 2022 TeV high energy physics conference about ttH CP analysis