Chinese sPHENIX Collaboration

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For the Chinese sPHENIX Collaboration

Scientific Interests and Hardware Contributions

1) Physics Interest
   - ➢Heavy flavor physics
   - ➢Jets physics

   Significant experiences on these physics topics from STAR, PHENIX and ALICE participation

2) Hardware Contributions

   EMCal Construction

   - ➢ 2 EMC module production facilities in China depending on the schedule requirement
   - ➢ Possible read-out electronics production/testing in China

   MVTX Considerations?

Members and Manpower

1) Central China Normal University
2) Fudan University
3) Institute of Modern Physics, CAS
4) Peking University
5) Shanghai Institute of Applied Physics, CAS
6) Sun Yat-Sen University
7) Tsinghua University
8) University of Science and Technology of China

Chinese Collaboration Coordinator: Jinhui Chen
Chinese EMCal Coordinator: Yajun Mao and Huan Zhong Huang
Chinese MVTX Coordinator: Yaping Wang

The Plan of Fudan Group for sPHENIX Project

- EMCal Module Production
- Simulation/Analysis Related to Upsilon Production

Fudan Team Members:

Subikash Choudhury, Wanbing He, Yu Hu*, Huan Zhong Huang,

Weihu Ma, Yang Shen, Xiaozhou Yu*

* Graduate Students

Interest on sPHENIX Project from PKU

EMCal sub-detector

- R&D on chinese tungsten powder to reduce cost
- Test new type SiPM
- QA

...

Set up a production center at Beijing

Team members: Yajun MAO, Yong BAN, Dayong Wang, Siguang Wang, Qiang Li and Graduate Students 25+

Plan of sPHENIX from USTC Group

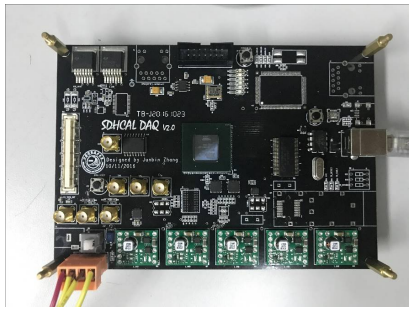
- Participate in EMCal mass production and tests
  - Participate in EMCal towers production
  - Test of readout components
- EMCal readout electronics
  - Assembly and tests of front-end electronics
  - Radiation tolerance study and enhancement methods
- Calibration and other related data analysis

Members: Xin Li, Changqing Feng, Zhongtao Shen (post doc), Zhen Liu (post doc)

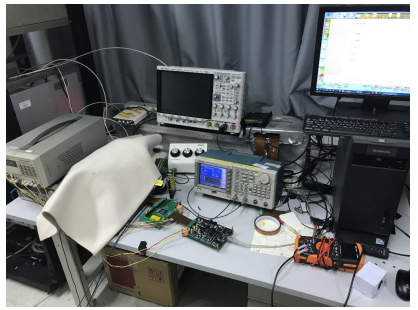
Present work on electronics: CEPC ECal & HCal

1) Pre-research for ECAL& HCAL of CEPC (USTC)
2) Design concept: absorber + Plastic Sintillator +**SiPM,** with SPIROC2 ASIC

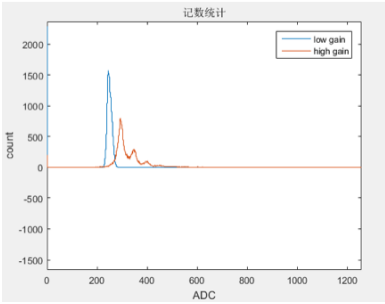
Front-end Card with SPIROC



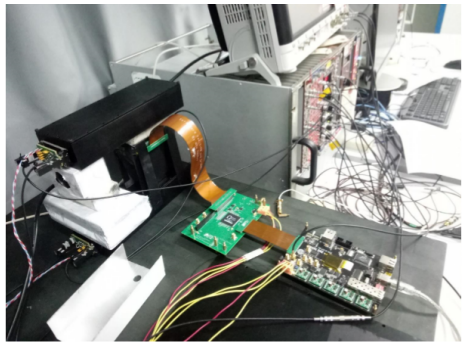
DAQ board



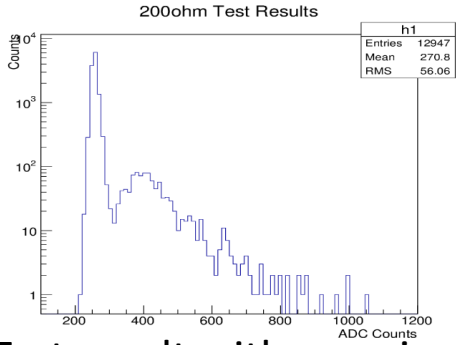
Dark-box test with SiPM



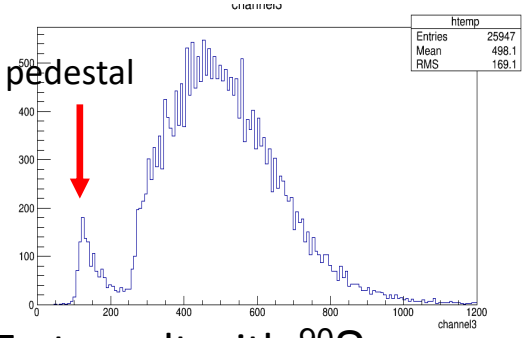
Single photon spectrum



Joint test with Scintillators



Test result with cosmic ray



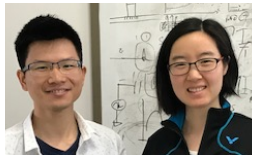
Test result with ^{90}Sr source

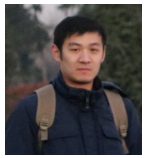
Tsinghua activity at sPHENIX

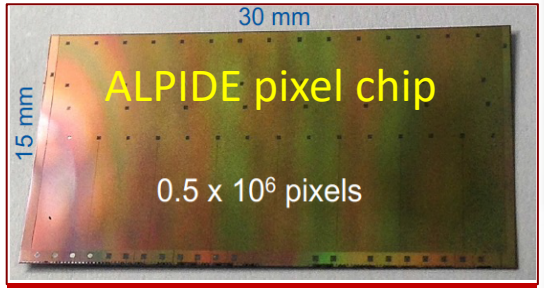
- Man power: one professor
  two associate professors
  two PhD students
  4 technicians

- Hardware R&D and production: High precision-TOF
  EMCal

CCNU and IMP team and plan

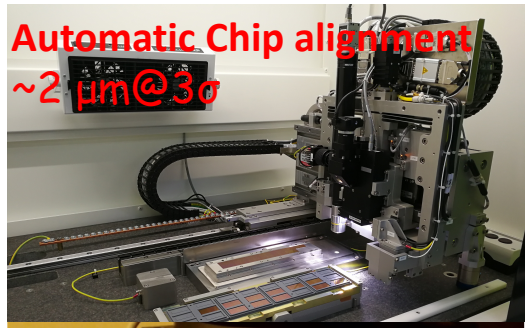






ALICE/ITS Chip Design/Testing（CCNU）：
Chaosong, Ping, Mangmang, Shuguang

ALICE/ITS OB HIC Assembly Team（CCNU）：
Biao、Jun、Daming、Kai、Peipei、Wenjing



- **2 FTE + few students from CCNU (additional postdoc in due time) and 2 FTE + few students from IMP/CAS**

SYSU plan for sPHENIX

Prof. Zhengyun You

- As a PHENIX member 2005-2011
  - PhD, Peking Univ. 2005-2007
  - Postdoc, Los Alamos National Lab 2008-2011
- Previous work on PHENIX
  - Forward Vertex detector (FVTX) upgrade
  - Simulation and reconstruction software
  - Heavy flavor separation
- The group of Prof. You at SYSU
  - 2 postdocs, 2 PhD students, 3 graduate students
- Plan on sPHENIX work
  - Physics simulation
  - Software development and computing

Simulation and Analysis

Chinese groups are interested in the physics simulation and software development at this state

1) The Y(1S), Y(2S) and Y(3S) states can all be observed with comparable yields via their dilepton decays. Y(1S+2S+3S)→e^+e^- decays will be simulated and analyzed first for Upsilon measurements:

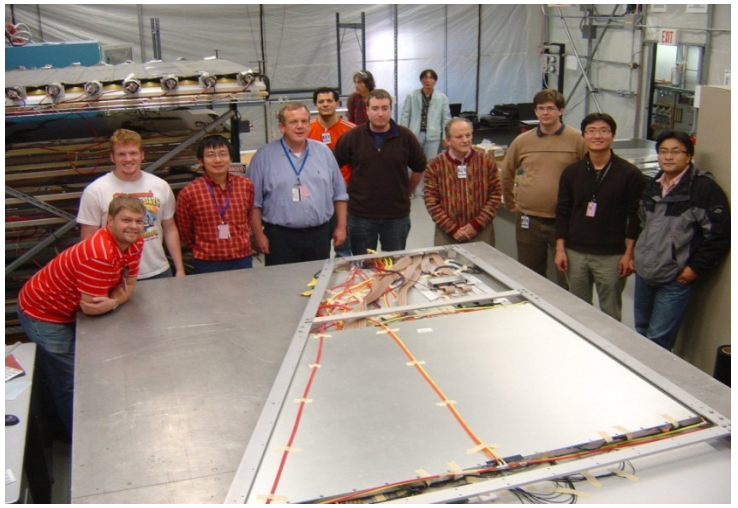
- To simulate the performance projection of Upsilon differential suppression in the heavy ion collision via its di-electron decay channel
  - Identifying and measuring the energies of the electrons from Y decays.
  - Background estimation under the Y peaks.
  - Mass resolution and S/B ratio estimation for separation of the three Y states.
  - To research and compare the effect of the medium simultaneously on three bottomonium states.

- To simulate the electron detection and identification capability in EMCal
  - the response of EMCal to electrons.
  - the resolution of EMCal for electrons.
  - the distribution of energy deposited in EMCal.
  - the electron identification efficiency.

Plan of CIAE on sPHENIX

- Will apply for membership in near future
- Participate in the EMCal block R&D, test and assembly
- Explore and optimize the manufacture processes and quality control standards

Detector R&D lab at CIAE



Project status

1) A key-project proposal has been submitted to NSFC on 3/2018, lead by Prof. Mao, for EMCal prototype

2) Resources from local universities are available to start the project

3) We will organize our teams, and prepare for a proposal to MOST for mass production of EMCal in China

Thank you for your attention!