Proposal of Mexican participation in SuperB

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For the Mexican Group

OUTLINE

- Detector construction
- Physics
- Funding and planing
- Participants
- Conclusions

Detector Construction

- Detector R&D and construction is our main goal in short term.

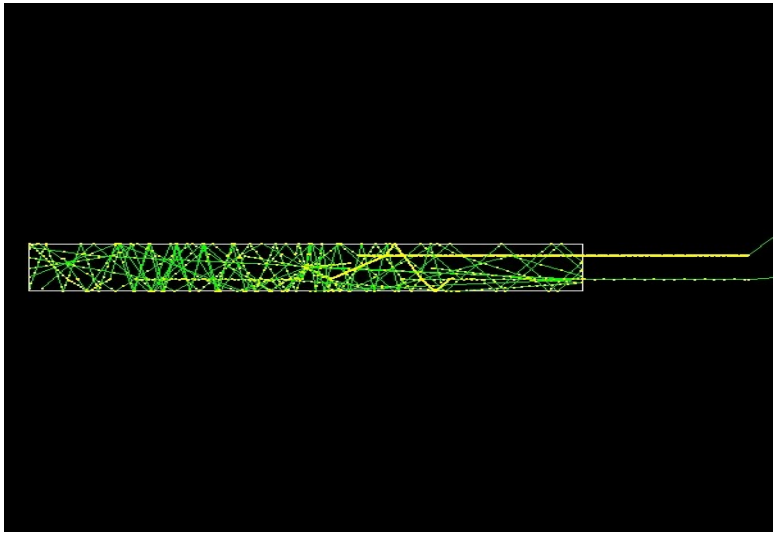
- Some members have participated in detector construction in other experiments in ALICE ACORDE, V0, both based in plastic scintillator, but all are willing to do effort.

- We decided for the IFR, since we have and equipment to work with plastic scintillator.

- We already made contact with IFR group. We got a piece of scintillator fiber and one SiPM, We are building the electronics to operate it. Also a simulation in Geant4 is being done (I. Leon)

- A protocol to move/share equipment, resources between Mexican institutions is being done.

- Process to acquire the material customs taxes are quite big, no project of this volume has ever been done in Mexico, this is being investigated.



Simulation of a plastic bar using Geant4, with two fibers..(I. leon)

The Physics program

We are interested mainly in Tau physics. The idea is to get input from theory and simulate it in the superb, already some ideas of moment of Rho, waiting for approval so all members and their students have access to the software.

We will do a physics workshop for the group in Mexico.
and also invite someone to have a tutorial.

We had a small cluster with about 20 cpu, using hadoop.

Already a first approach with the physics group by Gabriel Lopez Castro in the ELBA meeting.

Analysis people will move slowly from other experiments they Already have participating.

Participant Institutions

Participants a brief description

Universidad Autónoma de Sinaloa (UAS) Facultad de Ciencias Físico-Matematicas

- **Dr. Pedro Luis Manuel Podesta:** Experience in Data Analysis Bs,Bd in D0, offline. Currently doing b physics in ALICE. Interested in Data analysis, Detector development and software development.

- **Dr. Ildefonso Leon Monzón** Experience in Hardware, Developing plastic scintillator, Instrumentation. Interested in detector development.

- **Dr. Roberto Millan Almaraz.** (Electronic) Experience in Control, FPGA programing. Interested in develop electronics and transfer technology.

We had a detector lab and a small cluster. Looking for installations for building part of the detector.

Participants

Universidad de Guanajuato (UG) Division de Ingenieria y Ciencia Exactas.

- (PI) **David Delepine:** Experience in phenomenology Lepton number violation in B, CP violation in B. Interested in model developments.

- **Dr. Marco A. Reyes Santos** : Experience in Data analysis, spectroscopy of light mesons and charm photoproduction, Focus collaboration. Interested in data analysis, Detector construction.

Infraestructure: Laboratory of detectors.

Participants

Centro de Investigación y Estudios Avanzados del Instituto Politecnico Nacional (CINVESTAV), Departamento de Física

- (PI)**Dr. Eduard de la Cruz Burelo:** Experience in Data Analysis OmegaB, LambdaB, in D0, Currently doing B physics in CMS. Interested in Data analysis.

- **Dr. Gabriel Lopez Castro** Experience in phenomenology, tau, charm and bottom physics. Interested in model predictions about these subjects. (He wants full join collaboration, including doing shifts)

Participants

Benemerita Universidad Autonoma de Puebla (BUAP), Facultad de Ciencias Físico Matemáticas

- Dr. Arturo Fernandez Tellez : Detector Construction, ACORDE detector in ALICE, Interested in Detector Development, Data analysis.

Infraestructure

Detector lab, Electronic Lab, Computing (Modest)

Funding: CONACYT.

Participants

Universidad Nacional Autónoma de Mexico (UNAM), Instituto de Física

- **Dr. Genaro Toledo Sanchez:** Experience in phenomenology, tau physics and vector mesons, interested in develop models to data in superB. Associated not interested in do shifts or appear in list of authors.

Universidad Nacional Autónoma de Mexico (UNAM), Instituto de Ciencias Nucleares

- **Dr. Eleazar Cuautle Flores:** Work was developed at FOCUS/e831 experiment, analyzing data on charm baryons. Since 2002, start to collaborate with ALICE experiment, working on simulation of the detector. Strangeness hyperons.

Infrastructure: Laboratories detector, more people will be involved eventually, since this is the biggest University in Mexico.

Funding in Mexico

Main source is:

CONACYT : (National council of science and Technology)

- Yearly Basic Science projects.

1.2 M $MXN (66k Euros) per individual project (three years)
4.4 M $MXN (244k Euros) per project (four years) approved

- Extra especial projects
Variable, they are possibilities this year or next ones
We already apply to one, (0.5 M $MXN) Submited

- University funds (Per researcher)
(150k-200k $MXN) (7k-9k Euros) per year

Detector construction

Build an IFR module (9 layer) validate and establish the procedure to build and characterize them. For this we will use cosmic rays.

Electronics we are considering to be acquired in the project :

- **VME Computer card**
- **VME QDC**
- **VME 4 channels Fan in Fan Out**
- **High Voltage Supply**
- **Low Voltage supply**
- **VME TDC**

Material to build one IFR module
Plastic scintillator, fiber, material, electronics, SiAPD power supply,
We already have a VME crate plus some cards, this is now being used to build a beam monitor detector at ALICE

Computing Resources

First year, computing

Storage Element ? , hadoop seem to work nicely.
2 servers
Rack and no break

Working nodes will be provided by an existing cluster (UAS)
of 20 nodes (Dual core cpu, 4 GB ram, SCL 5.0)

Problem we have now is network connection, working on this with university collaboration with superB will give us good arguments to request more bandwidth. (Already fixed)

This is a first step we will request more on different projects.

Plan

Second year (33 K Euros)

- Start production in FCFM UAS.

Third year (66 K Euros)

Fourth year (33 K Euros)

To be decided: All modules will be build in only one installation, this Depends on the tools and cost estimates.

- Send all of them to superB (Shipping is considered in the project)

Mobility Expenses

Traveling is an important part in an effective collaboration.

We are considering 13.7 K Euros per year considering one visit to collaboration meeting, visits for students etc.

Other projects will be the main sources to get funding to this Activities, if it is required.

There is some modalities projects that had work very well for us like Helen, E-planet. We would like to know if it is possible to do something similar.

Material for construction and shipping (142 k),
Equipments (37K)
Mobility (54)
Computing (20K)
Total (253k)

Conclusions

- The project is approved, is a great responsibility for since for now there is only CMS, ALICE and now superb Mexican participation.

- Additional funding to individual projects are expected in the next years, mainly for mobility (already submitted one).

- Need to evaluate the procedure of construction. But we are not free restriction are in the ministrations of resources.