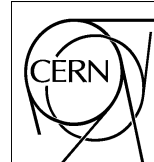


EUROPEAN LABORATORY FOR PARTICLE PHYSICS
COMPACT MUON SOLENOID EXPERIMENT

URL : <http://cmsdoc.cern.ch/cms.html>



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17 October 2006

CMS and the Helen Programme (1st year)

Executive Summary

Particle Physics groups from three Latin America countries are full members of the CMS Collaboration (Brazil, Colombia and Mexico). The CMS detector is now in the commissioning phase, getting ready for first collisions at the LHC in 2007. The Helen training programme is very timely to reinforce the participation of these groups in the CMS Collaboration. In general we in CMS have benefited a lot from the Helen programme and we are very thankful for the financial support received from EU.

During the 1st Helen year 10 students were sent at CERN for training in the various technical and physics activities related to CMS. Supervision was done by experienced CERN CMS scientists. In general the quality of the students was excellent and the supervisors are happy with the selection process. All supervisors remark that a training period of 6 months is preferable to one of 3 months if possible.

Three CMS senior physicists visited Brazil in the spring of 2006. In return eight professors (5 from Brazil and 3 from Colombia) came at CERN to discuss how they could contribute to startup physics in the first engineering run at 900 GeV in 2007 and for the first physics run at 14 TeV in 2008. For the second Helen year CMS plans to send more experienced physicists for longer periods in these countries to get them started on specific physics analyses.

Brazil:

Since Dec 2002 a Brazilian team has been a part of the CMS Collaboration. At the moment the team consists of four institutions: UERJ (Alberto Santoro), CBPF (Moacyr H. G. e Souza), UNESP (Sergio Novaes) and UFRJ (Jorge Barreto). The overall leader is Alberto Santoro. They have strong links with Fermilab and the D0 experiment. They participate actively in the World LHC Grid (WLCG). They have established two CMS Tier2s, one in Rio and one in Sao Paulo and are members of WLCG. They have submitted in 2005 a proposal to work on the upgrade of the forward pixel system of CMS. They want to participate in startup physics in 2007 and early physics in 2008. From D0 they have experience in top physics, bottom physics and diffraction.

For the 1st year of Helen, CMS has hosted 7 students from UERJ at CERN (1 CT, 4 STT and 2 AT). Three of them are physics students preparing PhDs. Two started to work on WW scattering and t-tbar diffractively produced within the corresponding

CMS physics groups. The third one wanted to learn about grid computing and was integrated in the computing group. The other four were technical students in the area of electronics. They have been trained in commissioning the readout electronics in the CMS electronics integration center with supervision by senior electronics engineers.

We also received the visit of five scientists (RT) for one month each. Their interest was to learn about the CMS Software and Computing and find out how to contribute to the CMS Software and Computing project. Three of them decided to start a software project on Muon alignment and are now integrated in the CMS muon group. The plan is to have them continue to work on the project with students back in Rio (UERJ and CBPF). The other two came from Sao Paulo, where the second Tier2 is located and worked on Grid computing.

Given their strong interest in WLCG, one CMS computer scientist (Jens Rehn) was sent for one month (March 2006) in Rio to help them with the grid integration of their Tier2s. Finally two CMS scientists (M. Della Negra and A. de Roeck) helped in the organization and gave talks to the LISHEP06 school and conference in Rio in April 2006, as part of the Helen programme.

Mexico:

A Mexican consortium led by Heriberto Castilla is part of the CMS Collaboration since 2004: Cinvestav (Heriberto Castilla and Alberto Sanchez), BUAP (Humberto Salazar), UASLP (Antonio Morales) and UIA (Salvador Carrillo). They collaborate with UC Santa Barbara (California, US) on the silicon tracker of CMS. They will be involved in the commissioning of the Silicon tracker at CERN. They are getting prepared for startup physics.

For the 1st year of Helen, CMS has hosted two excellent students from Mexico. One was a physics student. He integrated the work on silicon tracker integration and readout. The other one was a technical student in electronics. She worked for 6 months on the Tracker optical fibre readout system.

Colombia:

Universidad de Los Andes (Bogota) is in CMS since March 2006. The group is led by Carlos Avila and consists of 3 professors (C. Avila, Juan Carlos Sanabria and Bernardo Gomez) and two PhD students. The three professors came to CERN for one month each last summer (using Helen grants) to discuss in detail their possible contribution to CMS.

We concluded that they should integrate into the CMS RPC team and participate in the commissioning of the RPC system (Hardware and Software). One PhD student started to work on his PhD thesis at CERN. His thesis work will be related to the RPC trigger system and the associated muon physics. With the help of an Helen grant of 8 months he participated actively into the CMS Magnet test and cosmics challenge that was a crucial milestone successfully passed by CMS last summer. We hope to be able to keep him at CERN next year with the help the 2nd year of the Helen programme.



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