

Albert De Roeck: Statement for the Election of the CMS Spokesperson

The years 2012-2013 will be very exciting for our community and for science. We are at the Dawn of Discoveries in the New Energy Regime opened by the LHC collisions. We have witnessed that CMS is a fantastic detector, ideally suited for the thrilling physics journey we have initiated. We also have made a successful transition from a construction project to a running experiment. CMS must stand for excellence in science and high quality physics results. This begins with an efficient and high quality data taking up through the full processing chain, to the final approved physics results and publications. I consider the following main points of attention for the near future:

- Ensure high quality data recording, following the increasing performance of the machine in 2011 and 2012. This includes well thought-through trigger strategies, data quality monitoring and validation, efficient use of computing resources, and a well-oiled machinery for detector calibration.
- Ensure high quality science publications, by a good organization, careful planning and involving a maximum amount of brainpower in CMS to assist in defining the strategy of our publications.
- Ensure that we keep the technical know-how within the collaboration, in the short term to sustain the new concept of long (3 years) of continuous running, and in the longer term to guarantee efficient and successful execution of repairs and detector improvements during the technical stops and longer shutdowns.
- Preparing the upgrade of the detector planned for the next two long shutdowns. This involves securing the necessary funding, setting up the appropriate organization, and in planning carefully the various upgrade steps.

The mission of CMS

The main scientific mission of the CMS experiment is the discovery of new phenomena or new particles at this new energy regime: the Higgs particle, if it exists, and physics beyond the Standard Model. However I support strongly that we must have enough capacitance to also explore QCD, heavy ions, electroweak physics, heavy flavor physics and other physics opportunities in the new energy regime. I am personally engaged with collaborators in physics areas that span from searches for exotica to QCD.

In announcing discoveries, we should aim to be first, but first to make sure to be right. Hence, it is of utmost importance to have a nimble procedure in place to move swiftly and efficiently when the “discovery alarms” go off. We must have a thorough procedure of involving the full collaboration in the appropriate way, following proper procedures, yet keeping the requisite level of confidentiality, and organizing the necessary cross checks in time. For the former the CB representatives can play a key role. Similarly, we have to prepare for allowing for a very fast publication of the scrutinized analyses, something we so far have not yet fully demonstrated. We need to be prepared to have these procedures in place for the 2011 data taking.

Detector operation and data quality

The immediate task ahead is to make sure we cover our bases so the experiment operates successfully. Together we are more than 3000 scientists and engineers in CMS yet almost all areas are in a need of manpower. The ESP system will help to monitor the situation and can be used as a tool to see where we have a large mismatch in contributions among our institutes. With these data, management has to go for active recruitment to make sure all groups make their fair share to the technical and service contribution. I also believe that the plan to give more institutional responsibilities for technical tasks, up to work in the POGs, is a good model to follow up.

It is also of utmost importance that we secure the technical crews that presently guard the detector, to stay available to CMS. We experienced during the recent two shutdowns that this is vital for getting the job done in time and with the required quality. I will negotiate firmly with, eg CERN management, to guarantee this continuity.

Data Quality, run control, and software validation and an efficient computing model, are pillars on which physics analyses rely. An increasing level of automation will need to be developed, to deal with the increasing manpower intensity of the job. For software releases for online/offline/HLT we have to aim to better anticipate problems, and establish a more solid schedule that we can execute and keep up for our next big software cycles.

We have reached a very good level of understanding of our detector with the 2010 data. It is extremely important that we search for, and follow-up on all anomalous effects we observe, to aim for the very best possible detector understanding. In evaluations we should emphasize in particular those areas where we observe such deviations.

CMS upgrade

A major task in the next year is the upgrade of CMS. The rates are expected go up by a factor 100 before 2020. We have a Technical Proposal describing the most direct detector upgrade/repair needs. Furthermore, we have a

number of fruitful ideas documented, which propose extensions of capabilities, such as MPGDs in the muon system, or near beam proton taggers. We will have the challenging task of having to do top-level science with the existing detector, and at the same time having to steer an efficient transition to the upgraded detectors. The detector upgrade management should at all times be well integrated with the present over-all management of CMS.

To strengthen our upgrade plans, we can also benefit from new participation and new collaborators. For example, the Tevatron running is coming to an end, and there will be an additional shift of interest to the LHC. We have been approached by new regions that want to join the LHC program, eg by countries in South-East Asia. In case where CMS judges that a valuable contribution can be expected, a request to join the experiment will be encouraged.

Another aspect is our “co-habitation” with TOTEM. Clearly, TOTEM is an experiment with an approved physics program, but in the long term we should aim to be fully integrated, and tackle common physics topics.

Physics with CMS

The physics output of CMS so far has been overall very good. The experience with the 2010 data analysis and publications has revealed a number of areas where we can still improve. For one, we seem to have a number of repetitions of actions in the publication process, which we could make more efficient. With time, I am convinced that we should offload more responsibility of the physics approvals to the PAG groups, as the load on central physics management to organize and validate all approvals in serial will not scale. We also learned that an improved planning, eg for analyses to be combined in single papers, is needed. Presently we are not yet engaging sufficiently all available brainpower and experience in CMS in the publication process. I am therefore considering constituting a kind of oversight board where we can discuss and get advice on papers and publication strategies.

Management style

I believe in an open and dynamic management style with a strong emphasis on fluid communication. I plan to extend initiatives like the GWM, by more open discussions as needed, and by a weekly e-mail “message to the collaboration” with the highlights of the week. Fairness will be the key leitmotiv of my management. Responsibilities and rewards should be given on an equal opportunity basis, with special attention to the most deserving or needing collaborators. Since we are such a large collaboration we also have to make an effort to “discover” people in CMS for the right jobs, by personal and direct contact with the groups. I will be executive and decisive when the moment calls for it, for instance, on pressing technical issues, on physics « disputes », etc.

Young People in CMS

Young people are the future of our field and we must give them maximum chances to develop their interests and focus in the course of their career. I am a strong supporter of giving young people a chance in taking key positions, where appropriate. Rewarding young people explicitly includes those in our experiment who have been not been active in physics analysis but concentrated on other important CMS areas (DPG, POG, on/offline, computing).

CMS and the world

I strongly support High Energy Physics as world science, ie a science in which the whole world should be able to participate. I support, and assist, CERN as a laboratory to reach out to new participants for its program, exploring new regions. By the same token I also believe that outreach is a very important part of our program of work. We have to work to transmit the message of our science and our field to the world, and in CMS we have to guarantee the necessary resources for our outreach mission. We should also make maximal use of the exchange programs that allow far away regions to collaborate with us, such as the (former) Helen programs, e-planet, EU-Erasmus opportunities. CMS physics should be possible from all around the globe, with centers in local areas. I'd like to convene more initiatives with such centers, which should of course remain in sync with the over-all program of CMS. Our computing model is well adapted for that, which we have to continue to support.

Personal statement

When I started, at the end of the 90s, as a staff member at CERN, I had no doubt in my mind which LHC experiment to choose from. It was definitely the right choice: CMS has worked extremely well during the first physics year at 7 TeV, enabling a wealth of initial physics results to be published of which we can be very proud.

I have played various key roles in CMS over the last few years such as CMS simulation coordinator, physics simulation and reconstruction convener, MTCC offline/computing/analysis coordinator, exotica convener and now deputy spokesperson. I am ready to take on the important responsibility of spokesperson for CMS, in case the collaboration wishes me to do so.