

CERN-RRB-2010-078
29 SEPTEMBER 2010

PRINCIPAL LHCC DELIBERATIONS

29TH MEETING OF THE ALICE RESOURCES REVIEW BOARD
13 OCTOBER 2010

EMMANUEL TSESMELIS
SCIENTIFIC SECRETARY, LHCC

GENERAL

This document summarizes the principal LHCC deliberations concerning ALICE at the Committee's sessions in May, July and September 2010.

The LHCC considers that ALICE has made excellent progress in all aspects of the experiment and the Committee congratulates the ALICE Collaboration on its achievements.

CONCERNS FROM THE PREVIOUS ALICE RESOURCES REVIEW BOARD

SUB-SYSTEM	CONCERN	STATUS
Silicon Pixel Detector (SPD)	Loss of pixel channels due to failures in the cooling.	Problem identified to be related to clogging in the cooling system. There is, however, no easy solution due to the inaccessibility of the Inner Tracking System and investigations are continuing. The number of failures has stabilized.
Trigger	Departure of Birmingham team from the ALICE trigger group.	Possibilities to keep the Birmingham team within ALICE are being investigated.
Computing	Lack of resources for heavy-ion run.	Resources for the 2010 heavy-ion run have become available. It was decided to produce two records of raw data at Tier-0 (one on tape and one on disk) in order to make sure that no data loss occurs.

STATUS OF THE EXPERIMENT

SUB-DETECTORS

Most detector components are operating smoothly. The loss of channels of the Silicon Pixel Detector (SPD) due to failures in the cooling has not increased and 80% of the half-staves are in a working condition. Pedestal instabilities in several sub-systems will require further attention. Time Projection Chamber (TPC) trips have been observed and are most likely due to charging up of insulators inside the TPC. To improve the situation, the amount of water vapor in the detector gas has been increased and an additional RC-filter has been added to the high-voltage supply. The Particle Multiplicity Detector (PMD) exhibits sparks, resulting in a loss of pedestal information in the

front-end electronics. The situation was improved by running the PMD with a reduced high voltage, thereby reducing the spark probability without significant loss in efficiency.

TRIGGER

The LHCC also reviewed the current hardware and software status of the ALICE High-Level-Trigger (HLT) system. The goal of ALICE for this first LHC proton-proton run is to collect 10^9 minimum bias events, equivalent to 10 nb^{-1} integrated luminosity, and to record in parallel at least 50 nb^{-1} of rare events (high luminosity and muon triggers). It would be desirable to present a realistic HLT physics-menu plan (with trigger signatures, thresholds, and scaled-down factors) for the proton-proton run in 2011 so that all perturbative cross-sections (Y , jets, high- p_T photons, ...) can be measured up to the highest p_T as needed for reference data for future Pb-Pb runs at the nominal luminosity.

COMPUTING

One major incident with the computing in April-May 2010 resulted in a small loss of ALICE data. A configuration error in the CASTOR mass-storage system at the Tier-0 centre resulted in raw data being distributed across all available tape pools instead of to dedicated pools as intended. This included a pool in which tapes were recycled after some time. ALICE, ATLAS and CMS were affected, but only ALICE data files were overwritten, including 1773 files of collision data at 900 GeV centre-of-mass energy that had not yet been copied to the Tier-1 centre. All but 56 of these files were eventually recovered from the tapes. Actions taken include a review of the software change procedure and improved monitoring of CASTOR. For the heavy-ion running a back-up copy of ALICE raw data will be stored temporarily at Tier-0 until replication at Tier-1 has been completed.

PHYSICS ANALYSIS

Six papers have already been published and a few more are under internal ALICE review.

HEAVY-ION RUN

The ALICE experiment is ready for the first LHC heavy-ion run later this year.

In order to accumulate the largest amount of minimum-bias events in heavy ions, ALICE intends to collect data at a rate of 200 Hz. After discussions with CERN IT Department, it was decided to produce two records of raw data at Tier-0 (one on tape and one on disk) in order to make sure that no data loss occurs. In conjunction with the request of CMS to run without zero suppression during the heavy-ion run, the LHCC recommends a stress test with simultaneous running of ALICE and CMS with the maximum foreseen data transfer rate in order to make sure that there will be no bandwidth bottleneck at Tier-0 during heavy-ion running.

ALICE's request for a proton-proton run at the equivalent heavy-ion energy per nucleon was discussed. This is an important reference run for heavy-ion physics, in particular for the measurement of the nuclear suppression factor R_{AA} . ALICE had previously agreed that the required beam time would be taken in part from the heavy-ion contingent and the Committee recommends scheduling this run as early as convenient in order to ensure a speedy analysis and publication of the heavy-ion results.

2010-2011 TECHNICAL STOP

The Committee discussed the installation plans for the 2010-2011 technical stop. ALICE intends to install the remaining Electromagnetic Calorimeter (EMCal) modules and three additional Transition Radiation Detector (TRD) modules.

ALICE UPGRADE

Plans for the upgrade of the ALICE experiment are underway. It is expected that these will include a beam pipe with reduced radius, an upgraded pixel detector and an extension of the momentum range for particle identification. The plans will be finalized once the first LHC heavy-ion run has been completed and experience from this run can be taken on board for the ALICE upgrade plans. The Committee encourages the ALICE Collaboration to further their studies and continue developing their experimental design. The LHCC will discuss extensively the ALICE upgrade plans at its upcoming session and encourages preliminary discussions with the funding agencies on possible commitments to be addressed in detail at the April 2011 session of the Resources Review Boards.

ALICE DIJET CALORIMETER ADDENDUM TO THE ELECTROMAGNETIC CALORIMETER TECHNICAL DESIGN REPORT

The Dijet Calorimeter (DCal) expands the physics capabilities of the Electromagnetic Calorimeter (EMCal) by enabling back-to-back high- p_T correlation measurements. In combination with the EMCal, the DCal forms a two-arm electromagnetic calorimeter. The DCal consists of 6 supermodules of the EMCal design in conjunction with 3 supermodules of the Photon Spectrometer (PHOS) detector. The DCal allows the measurement of hadron-jet and jet-jet correlations at high statistics over a broad kinematic range. Of particular importance is the ability to trigger on high- p_T π^0 in correlation with a recoiling jet. The DCal is technically sound and enhances significantly the physics potential of ALICE. The Committee has no major concerns. The LHCC **recommended** general approval of the ALICE DCal Addendum to the EMCal Technical Design Report. The Research Board **approved** the Addendum at its meeting in September 2010.