XII International Conference on New Frontiers in Physics
10-23 July 2023, OAC, Kolymbari, Crete, Greece

Contribution ID: **18** Type: **Talk**

The ATLAS experiment Phase-I upgrades for the LHC Run-3

Tuesday, July 18, 2023 11:25 AM (25 minutes)

With the end of RUN-2, the LHC has delivered only 4% of the collision data expected to be available during its lifetime. The now ongoing data-taking campaign – RUN-3 – will more than double the integrated luminosity the LHC accumulated during Runs 1 and 2. The Run-3 will be the herald of the HL-LHC era, an era when 90% of total LHC integrated luminosity (3 to 4 ab^{-1}) will be accumulated, allowing ATLAS to perform several precision measurements to constrain the Standard Model (SM) theory in yet unexplored phase-spaces and, in particular, in the Higgs sector, only accessible at LHC. While direct searches have not yet provided solid indications of new physics beyond the SM, they can be complemented by indirect searches, searches these that are based on the ability to perform very precise measurements, a highly complex task at a hadron collider, which requires tight control of theoretical predictions, reconstruction techniques, and detector operation. To answer the quest for high precision measurements in a high luminosity environment, a comprehensive upgrade of the detector and associated systems was devised and planned to be carried out in two phases in ATLAS. The Phase-I upgrade program, recently completed, brings new features to the muon detector, to the electromagnetic calorimeter trigger system and to all trigger and data acquisition chain, and permits ATLAS to preserve its excellent performance, coping with the more than 80 simultaneous collisions per bunch crossing expected in Run-3 to ultimately reach the goal to accumulate about 350 fb^{-1} of integrated luminosity during this campaign. After this, ATLAS will proceed with the Phase-II upgrade to prepare for the high luminosity frontier (HL-LHC) where the ATLAS experiment will face more than 200 simultaneous collisions per bunch crossing, which will then require an even more ambitious upgrade program. The presentation will discuss in detail the aforementioned Phase-I new systems, and bring the first results of their commissioning and operation during RUN-3.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

ATLAS

Is the speaker for that presentation defined?

No

Details

This abstract is being submitted by ATLAS Upgrade Speakers Committee, and the conference organization will be informed when the speaker selection is completed.

Internet talk

Maybe

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Session Classification: High Energy Particle Physics

Track Classification: Main topics: High Energy Particle Physics