Contribution ID: **142** Type: **Oral talk (15 min + 5 min questions)**

Performance of the precise electromagnetic calorimeter ALICE/PHOS and upgrade plans

Tuesday, 12 July 2022 13:30 (20 minutes)

The photon spectrometer (PHOS) of the ALICE experiment is a high-granularity PbWO4 crystal calorimeter with avalanche photodiode (APD) readout. Its primary physics goal is the measurement of direct photon and neutral meson spectra and correlations in pp, p-A and A-A collisions. PHOS participated in LHC Run 1 (2009-2013) and Run 2 (2015-2018), during which a large amount of physical data were collected in pp, p-Pb and Pb-Pb collisions.

The choice of active material with small Molière radius allows PHOS to operate in a high-multiplicity environment and to reconstruct neutral pions
by two-photon decays up to very high transverse momenta ˜60 GeV/c. In order to increase the light yield of the crystals and reduce electronic noise,
PHOS is cooled down and kept at a constant temperature of -25ˆ{o} C. This resulted in excellent energy and position resolutions. Dedicated L0 and L1 triggers were used to increase collected integrated luminosity during data taking.

We will present an overview of the PHOS performance during Runs 1 and 2 and plans for an upgrade for LHC Run 4 and beyond with the aim of improving the time and energy resolution and extending the dynamic range down to low energies. This goal can be achieved by upgrading the photodetectors from APD to multi-pixel photon counters (MPPC), upgrading the front-end electronics and the detector mechanics. The expected improvements of the time and energy resolutions will be presented and the resulting reduction of systematic uncertainties of ongoing analysis and new possibilities will be discussed.

The speaker is a student or young scientist

No

Section

1. Intermediate and high energies, heavy ion collisions

Primary author: PERESUNKO, Dmitri (NRC Kurchatov institute)

Presenter: PERESUNKO, Dmitri (NRC Kurchatov institute)

Session Classification: Intermediate and high energies, heavy ion collisions