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The performance of the ALICE High Momentum Particle Identification Detector in pp, p-Pb and Pb-Pb collisions

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The High Momentum Particle Identification Detector (HMPID) is specifically developed for track-by-track particle identification in ALICE. The HMPID is a ring imaging Cherenkov detector with an active area of 10.5 m^2 of caesium iodide photo-cathodes installed in MWPC-s filled with pure methane. It identifies $\pi^{\pm}$ and $K^{\pm}$ in the momentum range $1 - 3$ GeV/c, and p in the range $1.5 - 5$ GeV/c.

The performance of the photo-cathodes during LHC Run1 period (2010-2013) has been investigated by the analysis of data from pp and p-Pb collisions. The number of reconstructed photons shows that there was no caesium iodide quantum efficiency loss (ageing), which is consistent with the measured integrated charge dose of 0.0133 mCcm^{-2}. A Monte Carlo procedure is ongoing to extract the quantum efficiencies, from the first results we found that no significant difference between the extracted quantum efficiencies and the measured ones at the production time of the photo-cathodes (2003).

The performance of statistical and track-by-track particle identification have also been investigated. The statistical PID was successfully applied to the measurement of inclusive hadron production in pp collisions at $\sqrt{s} = 7$ TeV. The purity and contamination of particles have been extracted from Hijing Monte Carlo generated events (Pb-Pb at $\sqrt{s_{\rm NN}} = 2.76$ TeV) and used as an input for the ongoing physics studies using track-by-track PID

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