

# Abstract

In this research, the signal extraction and efficiency of (anti-)deuteron production in  $pp$  collisions at  $\sqrt{s} = 13 \text{ TeV}$  have been measured with high multiplicity (HM) trigger using TPC+TOF (Time Projection Chamber + Time of Flight) data from Large Hadron Collider (LHC) experiment: ALICE detector at CERN. The purpose of (anti-) deuteron signal extraction and efficiency analysis is to contribute towards the estimating and understanding the real yield of (anti-) deuteron which would be useful hint to understand the production mechanism of (anti-) deuteron as the production mechanisms of light (anti-)nuclei are not understood. The desired analysis has been performed in kinematic region of transverse momentum ( $p_T < 5.5 \text{ GeV}/c$ ) at joined data signals collected from ALICE detectors: TPC and TOF via high multiplicity trigger provided by Vzero (V0) detector whose timing information is exploited to select the different centrality classes for the HM analysis. The behavior of (anti-) deuteron signal is observed using TOF mass squared ( $m^2$ ) distribution including the correction for detector efficiency and acceptance against the observable i.e.,  $p_T$  ( $\text{GeV}/c$ ).