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A study of the proton reconstruction efficiency with the ATLAS Roman Pot detectors using an overlay technique of Monte Carlo signal events with zero-bias collider data.

The purpose of the ATLAS Roman Pot (ARP) detector is to measure protons scattered at very small angles. ARP aims to study elastic and diffractive events, exclusive production and photon induced interactions. In LHC Run 2, ARP participated in the ATLAS high-luminosity data taking. In addition, several special runs with reduced luminosity were taken. Any cross section measurement requires good understanding of the particle reconstruction efficiency. This task is particularly complicated in case of forward protons where actual beam condition is important part of the working environment. Modelling of the very forward region in terms of primary particle flux and inactive material producing secondary particle is generally not precise.An overlay technique of Monte Carlo signal events with zero-bias collider data overcome these difficulties and may provide better understanding of the proton reconstruction efficiency.This poster presents results of the proton reconstruction efficiency with the ARP detectors during the LHC Run 2.

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