



# ATLAS NOTE

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## Simple Simulation of the Micromegas Trigger at High Rates, and a Proposal for Improving the $\phi$ Measurement

J. Farah<sup>a,b</sup>, N. Felt<sup>a</sup>, M. Franklin<sup>a</sup>, P. Giromini<sup>a</sup>, J. Philion<sup>a</sup>, A. Tuna<sup>a</sup>, A. Wang<sup>a</sup>

<sup>a</sup>*Harvard University, Cambridge, Massachusetts 02138, USA*

<sup>b</sup>*University of Massachusetts Boston, Boston, Massachusetts 02125, USA*

### Abstract

We simulated the MM Trigger Processor at high rates. We can improve the non-precision measurement dramatically.

## **1 Introduction**

Introduction.

## **2 Micromegas detector and electronics**

Micromegas detector and electronics.  
Test stand measurements.

## **3 High luminosity LHC**

HL-LHC conditions.

## **4 Simulation**

Standalone simulation.

## **5 Small stereo roads**

Proposal and performance of small stereo roads.

## **6 Hardware resources**

FPGA resources.

## **7 Conclusion**

Conclusion.

## References

- [1] ATLAS New Small Wheel Technical Design Report. [ATLAS-TDR-020](#).  
[ATL-COM-MUON-2017-036](#).
- [2] P. Giromini *et al*, Performance of a Micromegs octuplet in the time of noise.  
[ATL-COM-MUON-2017-036](#).
- [3] P. Giromini *et al*, Performance of a Micromegs octuplet after removing the major cause of noise.  
[ATL-COM-MUON-2017-040](#).
- [4] <https://twiki.cern.ch/twiki/bin/viewauth/Atlas/NewSmallWheel>.
- [5] [https://twiki.cern.ch/twiki/pub/Atlas/February\\_2015\\_design\\_reviews/ADDC\\_document\\_for\\_2015\\_Feb\\_NSW\\_review\\_v1.0.pdf](https://twiki.cern.ch/twiki/pub/Atlas/February_2015_design_reviews/ADDC_document_for_2015_Feb_NSW_review_v1.0.pdf).
- [6] B. Clark *et al*, An Algorithm for Micromegas Segment Reconstruction in the Level-1 Trigger of the New Small Wheel. [ATL-COM-UPGRADE-2014-012](#).
- [7] S. Chan *et. al*. Micromegas Trigger Processor Algorithm Performance in Nominal, Misaligned, and Misalignment Corrected Conditions. [ATL-COM-UPGRADE-2015-033](#).
- [8] K. DiPetrillo *et al*, ATL-COM-MUON-2014-069.
- [9] Simulation of the ATLAS New Small Wheel (NSW) System [ATL-MUON-SLIDE-2017-248](#).
- [10] ATLAS Muon Spectrometer Phase-II Upgrade Technical Design Report.  
[ATL-COM-MUON-2017-033](#).