Study of Reduced L1 Acceptance

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ME 1/1 Descope

Investigate relative acceptance loss at Level-1 for $|\eta|<2.1$ vs. $|\eta|<2.4$ using MuonAnalysis ntuples in $ANA_MUON

Apply low luminosity thresholds
- $P_T(1mu) > 20$ GeV
- $P_T(2mu) > 4$ GeV

**Earlier study: CMS Note 1998/020**
- Pretty good agreement with this study
- Thresholds were (20,4) GeV for high lumi, (7, 2+) GeV low lumi
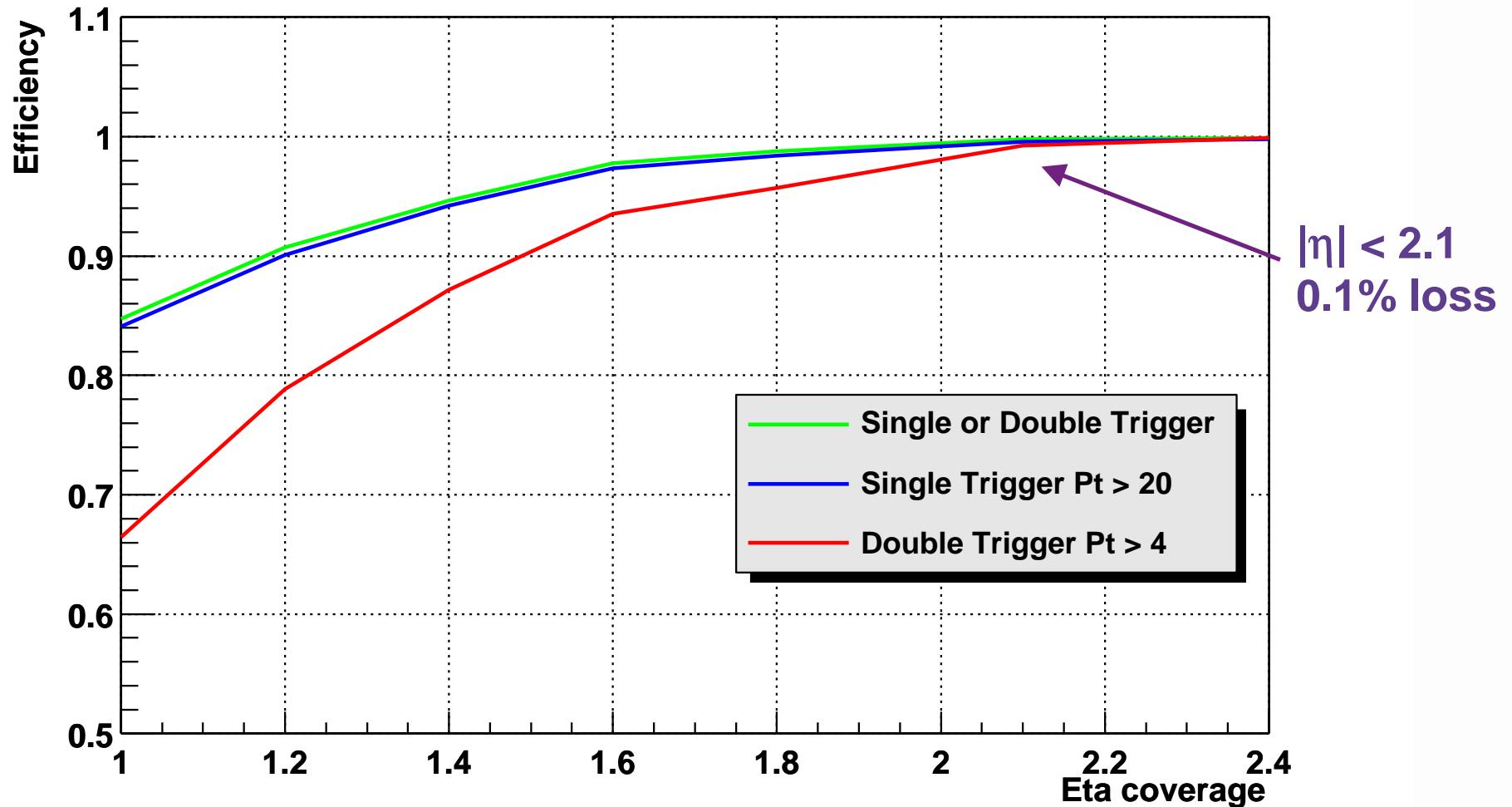
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$H \rightarrow 4\mu$ L1 Efficiency

M = 150 GeV
3000 events

L1 Trigger Efficiency for H->4mu

$|\eta| < 2.1$
0.1% loss

Legend:
- Single or Double Trigger
- Single Trigger Pt > 20
- Double Trigger Pt > 4

Axes:
- Efficiency (y-axis)
- Eta coverage (x-axis)

$H \rightarrow 4\mu$ Acceptance (Generated)

Relative Acceptance for H->4mu

M = 150 GeV
3000 events

|η| < 2.1: 18% loss incurred if no offline recon of high η muons

Legend:
- 1 muon
- 2 muons
- 3 muons
- 4 muons

Axis labels: Acceptance (y-axis), Eta coverage (x-axis)
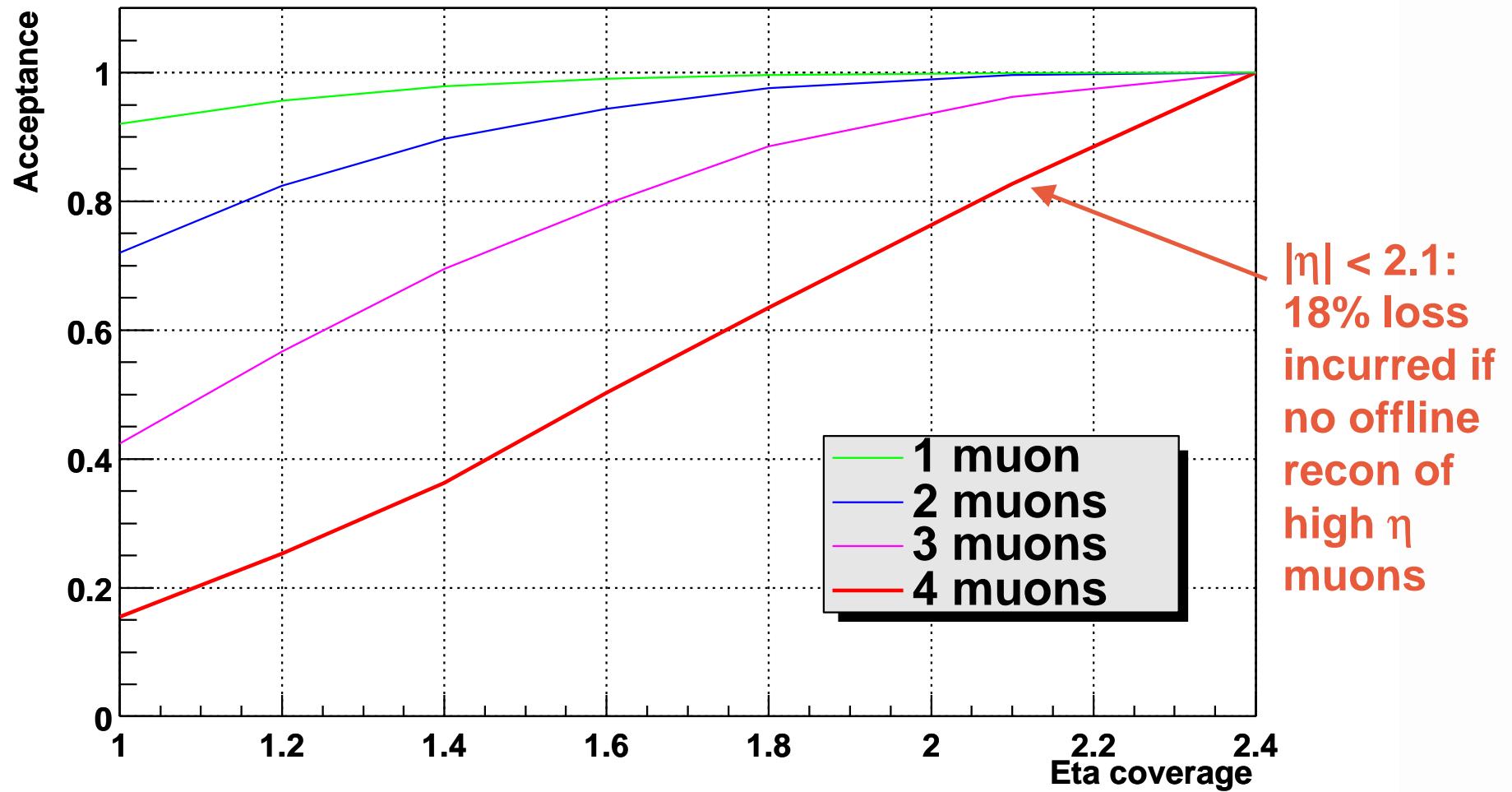
$H \rightarrow 2\mu$ Relative L1 Efficiency

$H \rightarrow 2\mu$ Acceptance (Generated)

Relative Acceptance for H->2mu

M = 140 GeV
1545 events
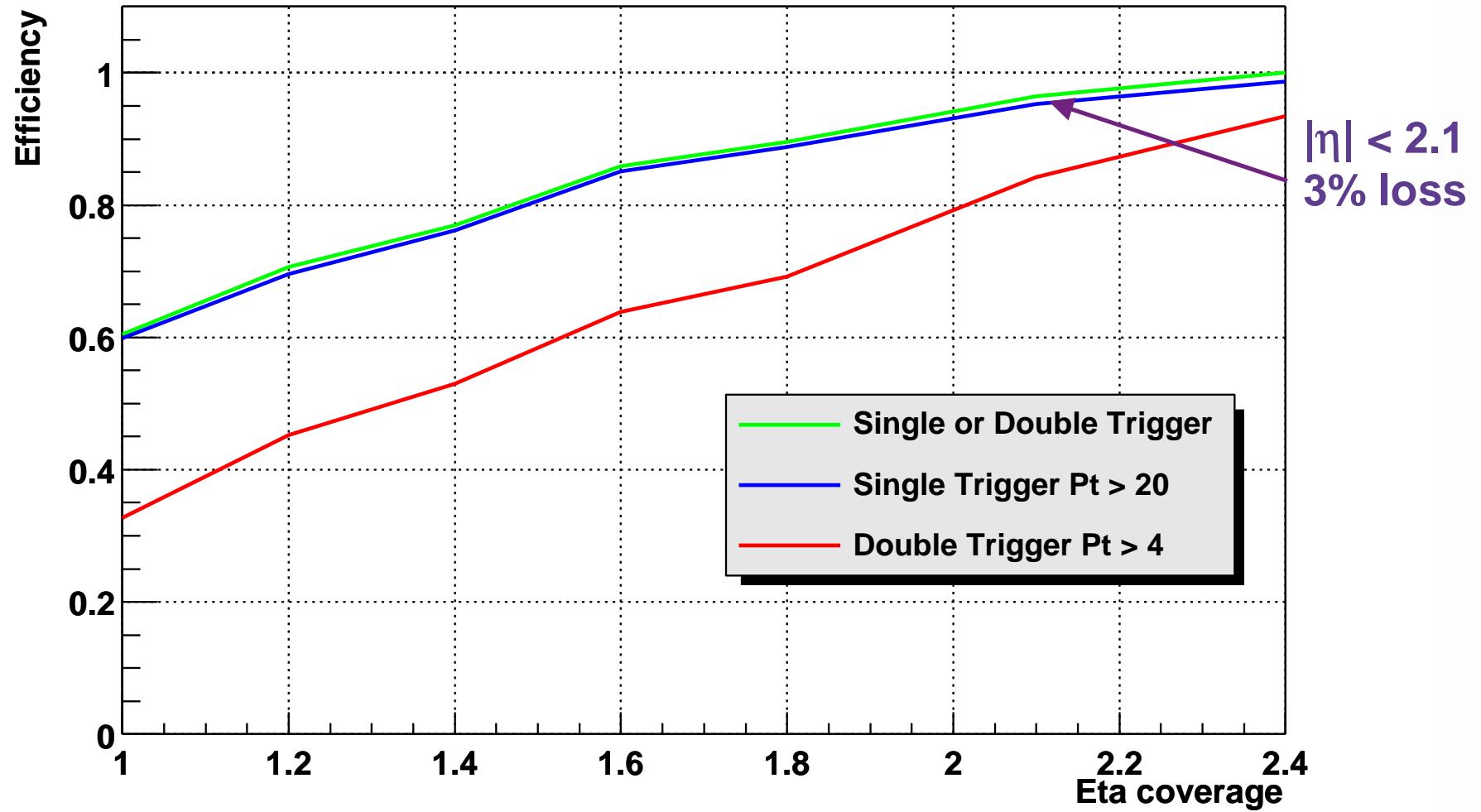
$|\eta| < 2.1$:
11% loss
incurred if
no offline
recon of
high η
muons
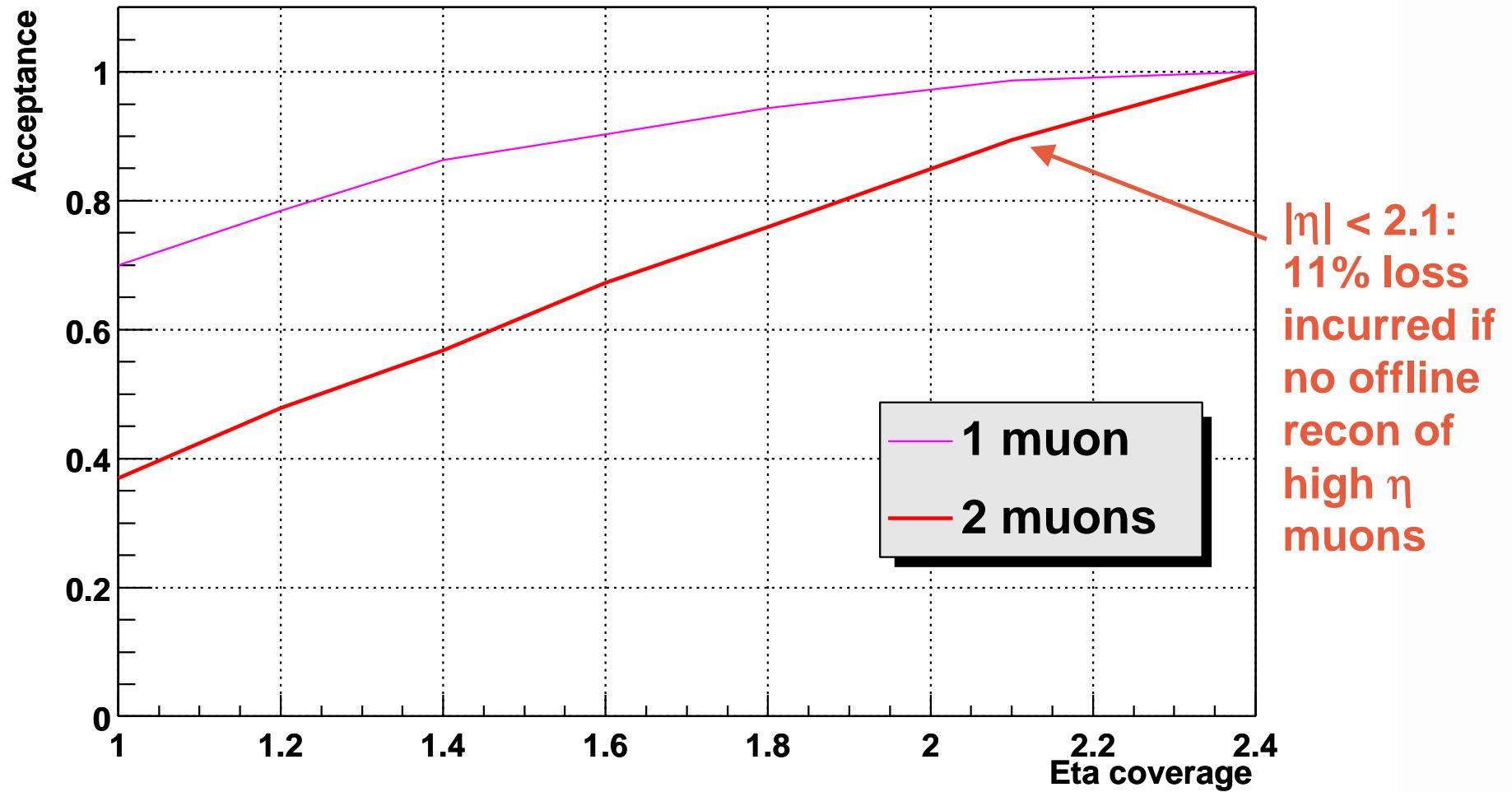
tt → 1μ Relative L1 Efficiency

6500 events

Relative L1 Trigger Efficiency for top->1mu
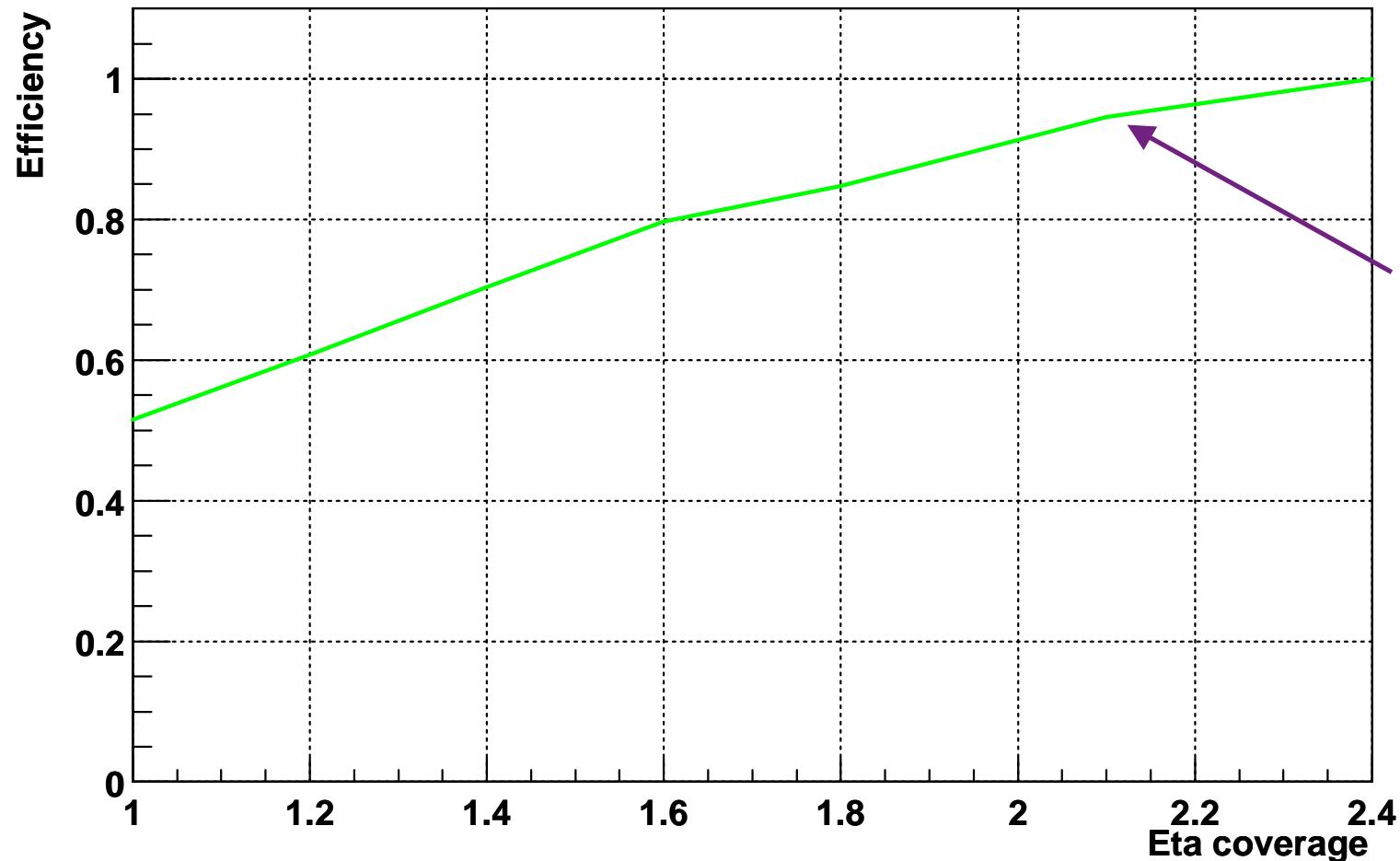
$|\eta| < 2.1$
5% loss

W → 1μ Relative L1 Efficiency

Relative L1 Trigger Efficiency for W->1mu

$|\eta| < 2.1$
13% loss

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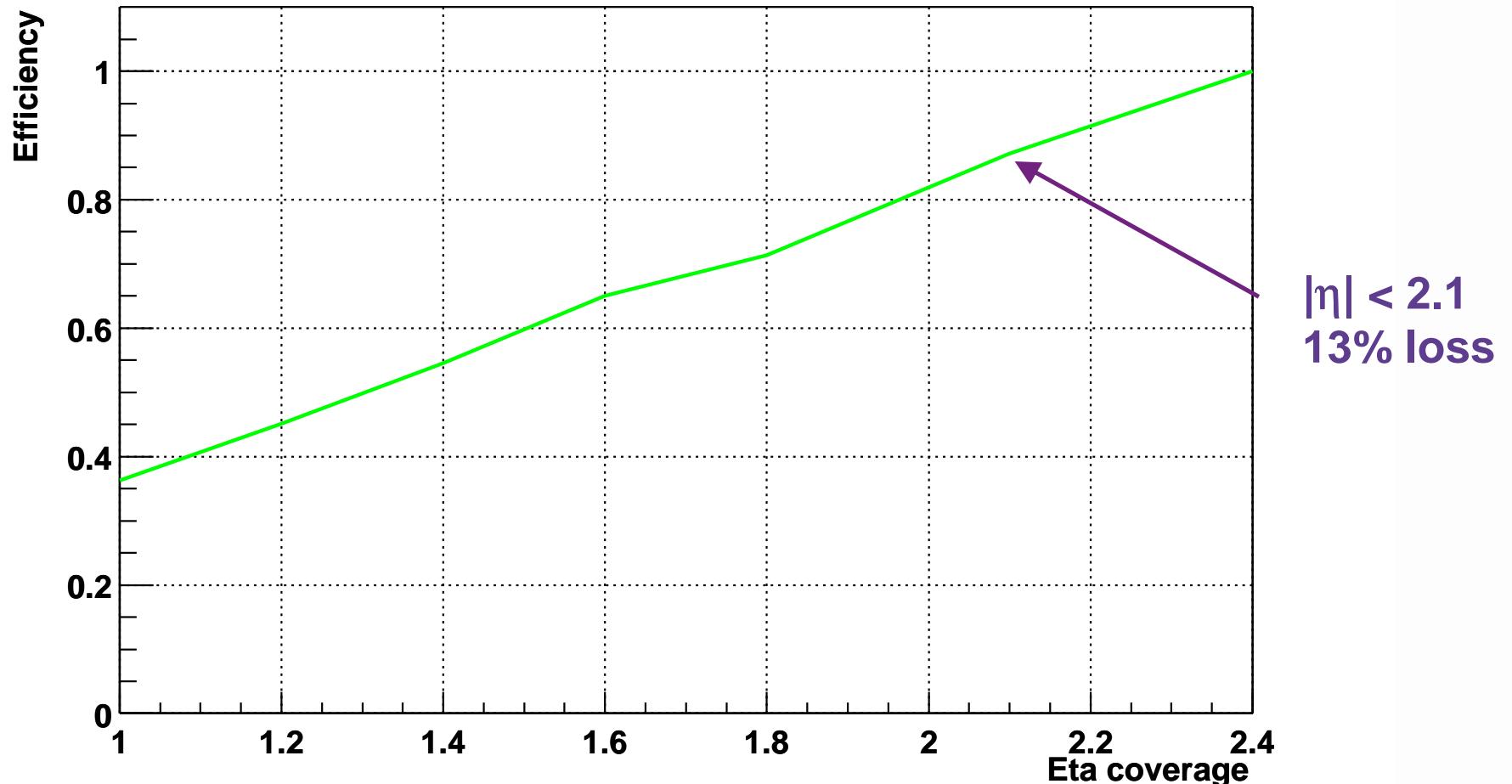
γ*/Z → 1μ Relative L1 Efficiency

Relative L1 Trigger Efficiency for Gamma/Z->1mu

|η| < 2.1
14% loss

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