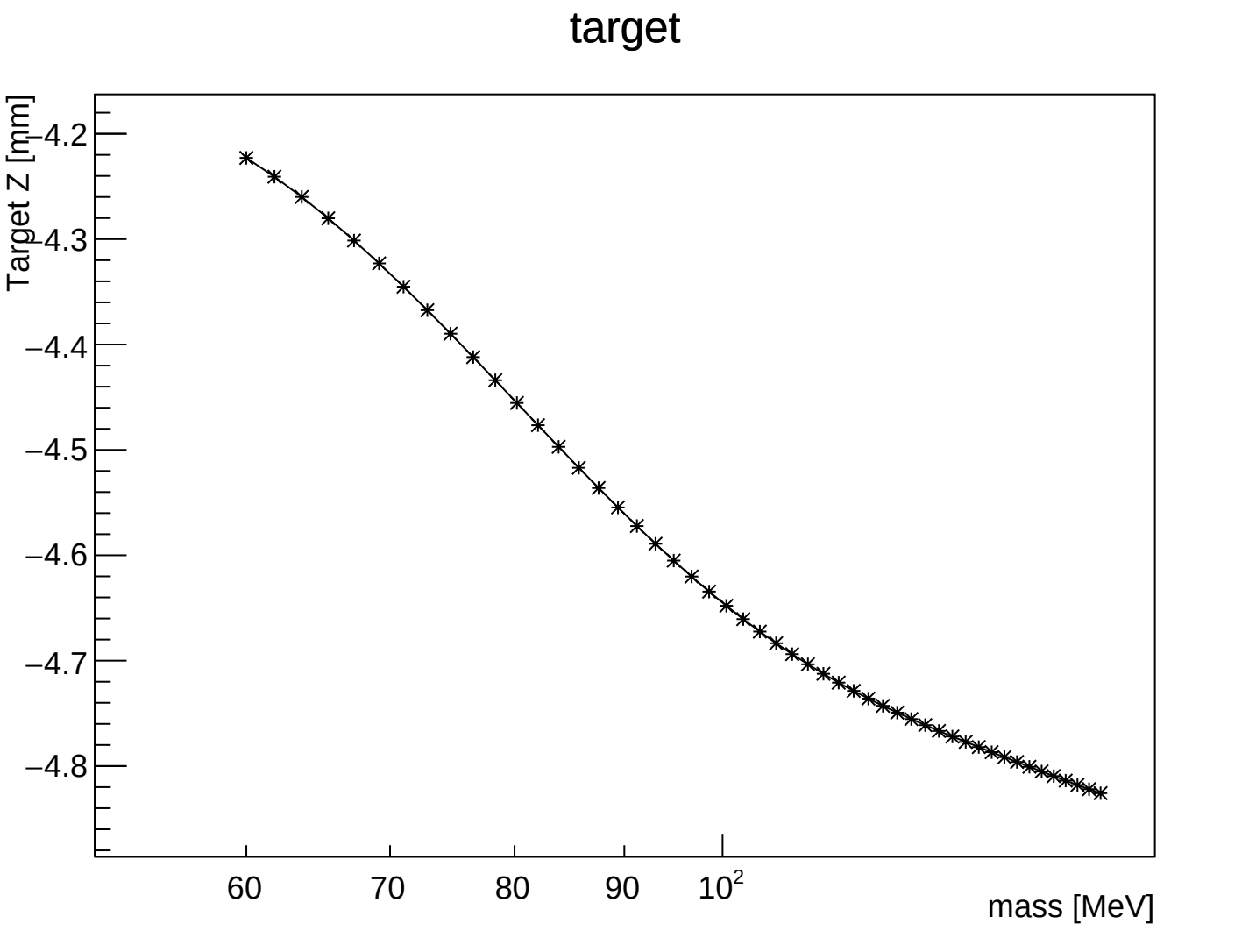
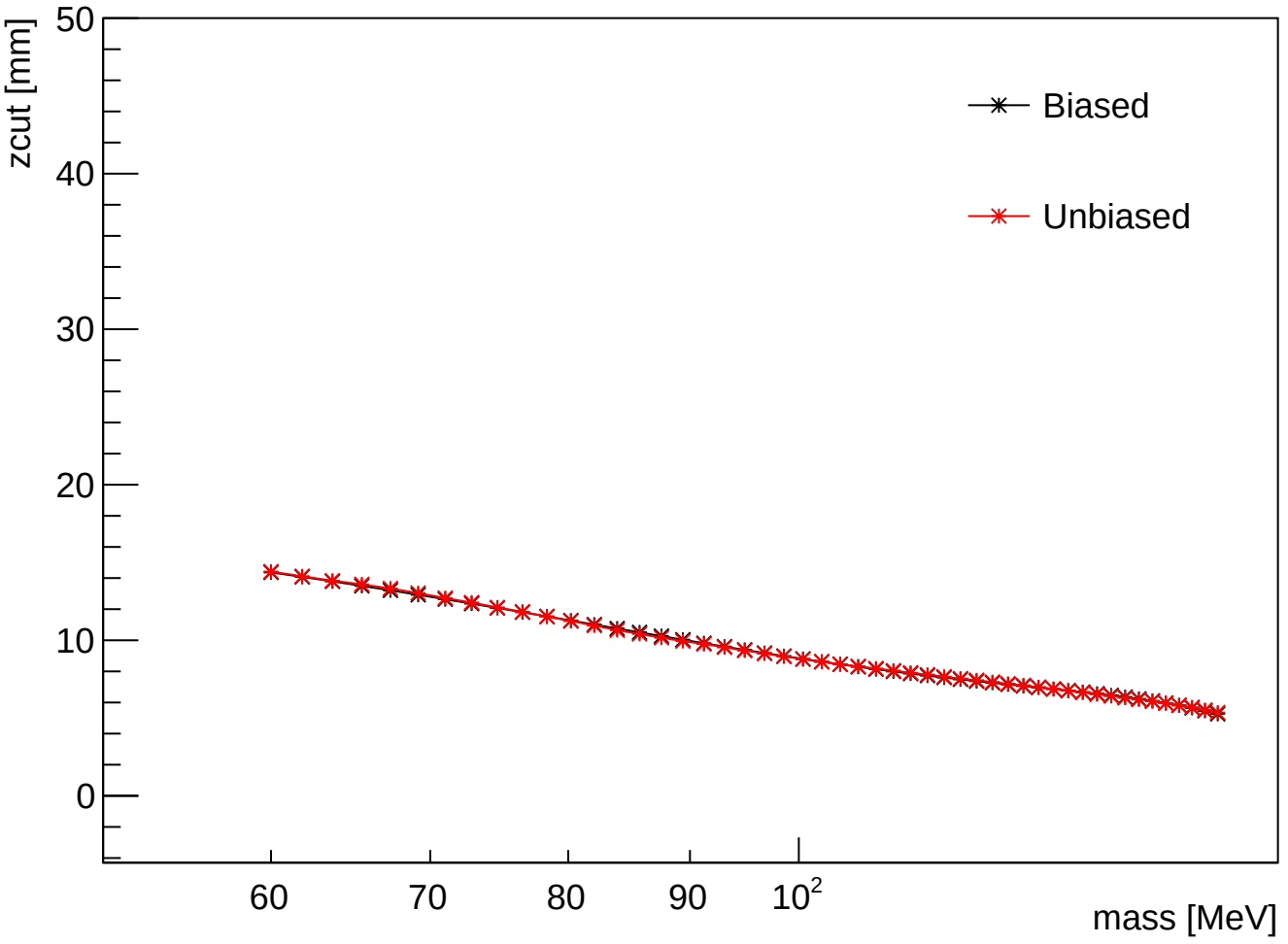
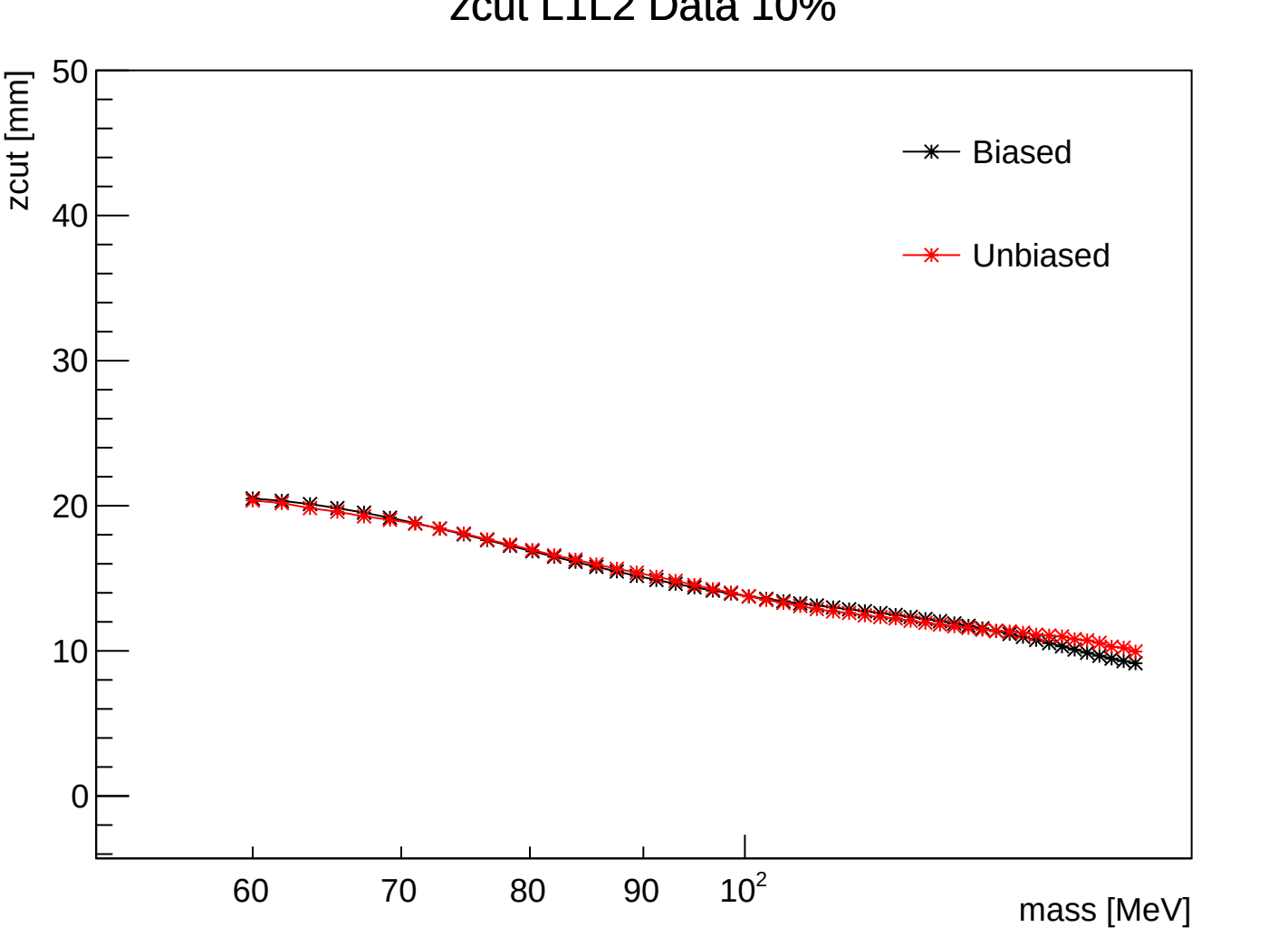
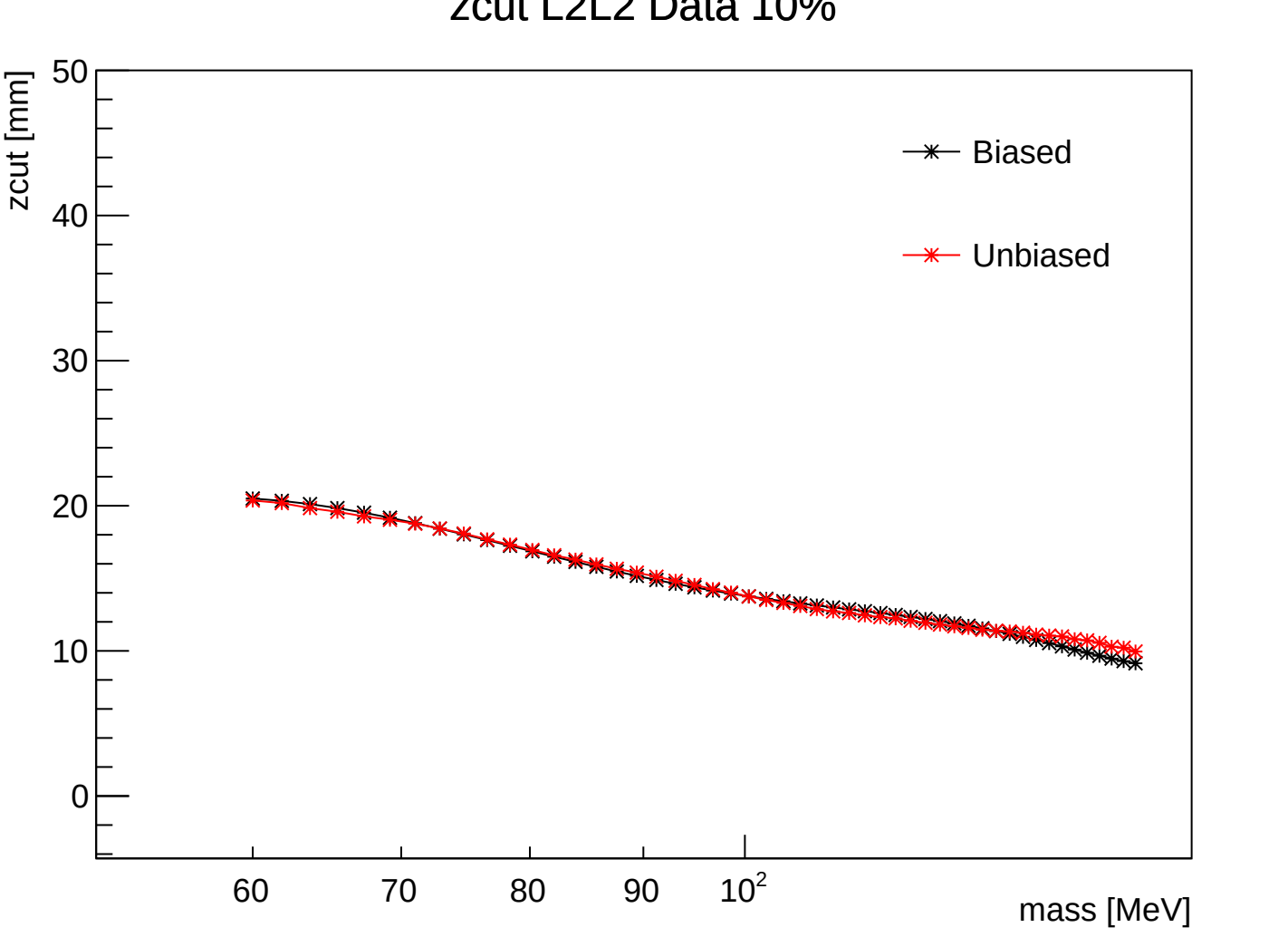
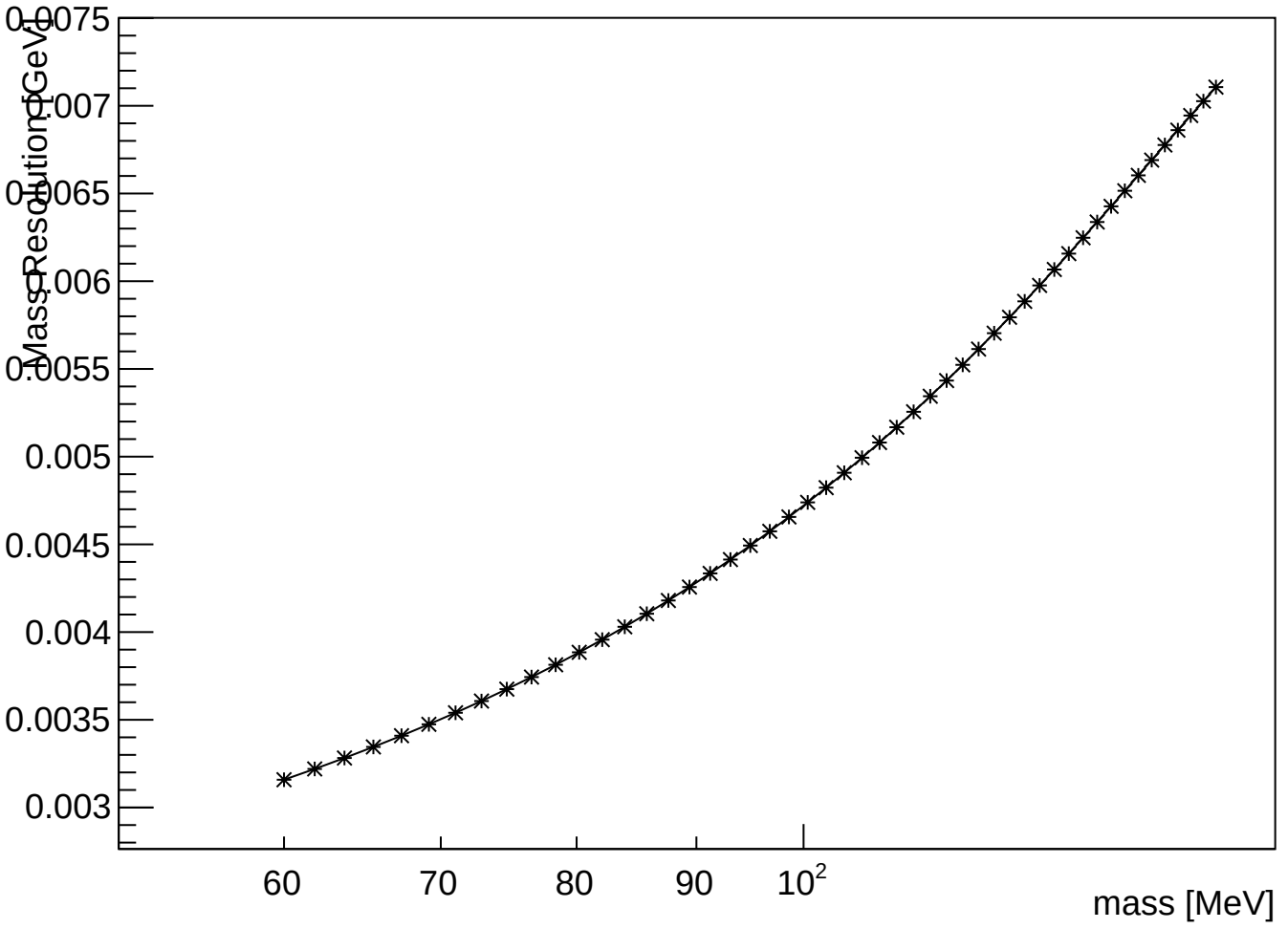
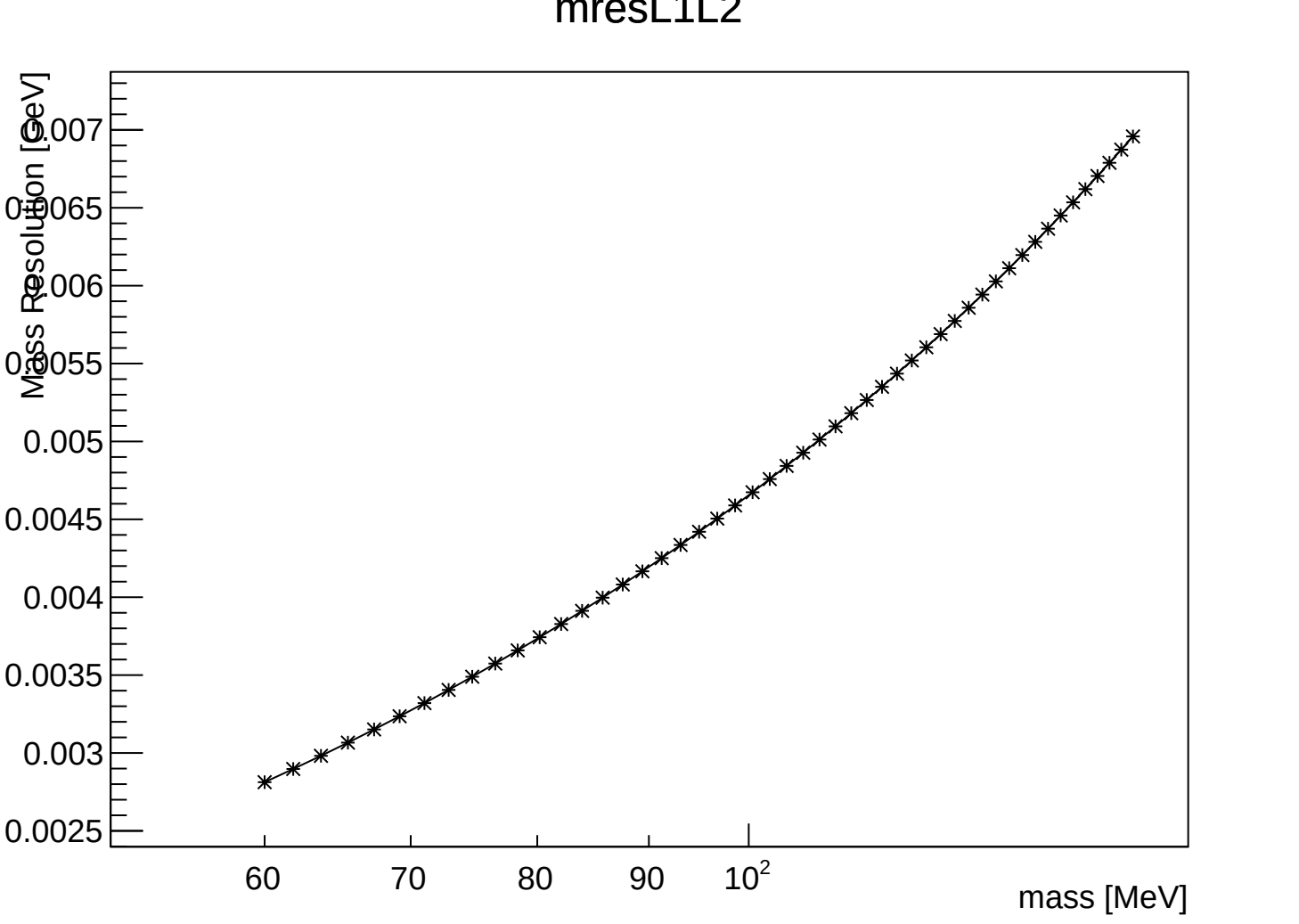

target
Target Z [mm]
−4.2
−4.3
−4.4
−4.5
−4.6
−4.7
−4.8
60
70
80
90
10^2
mass [MeV]

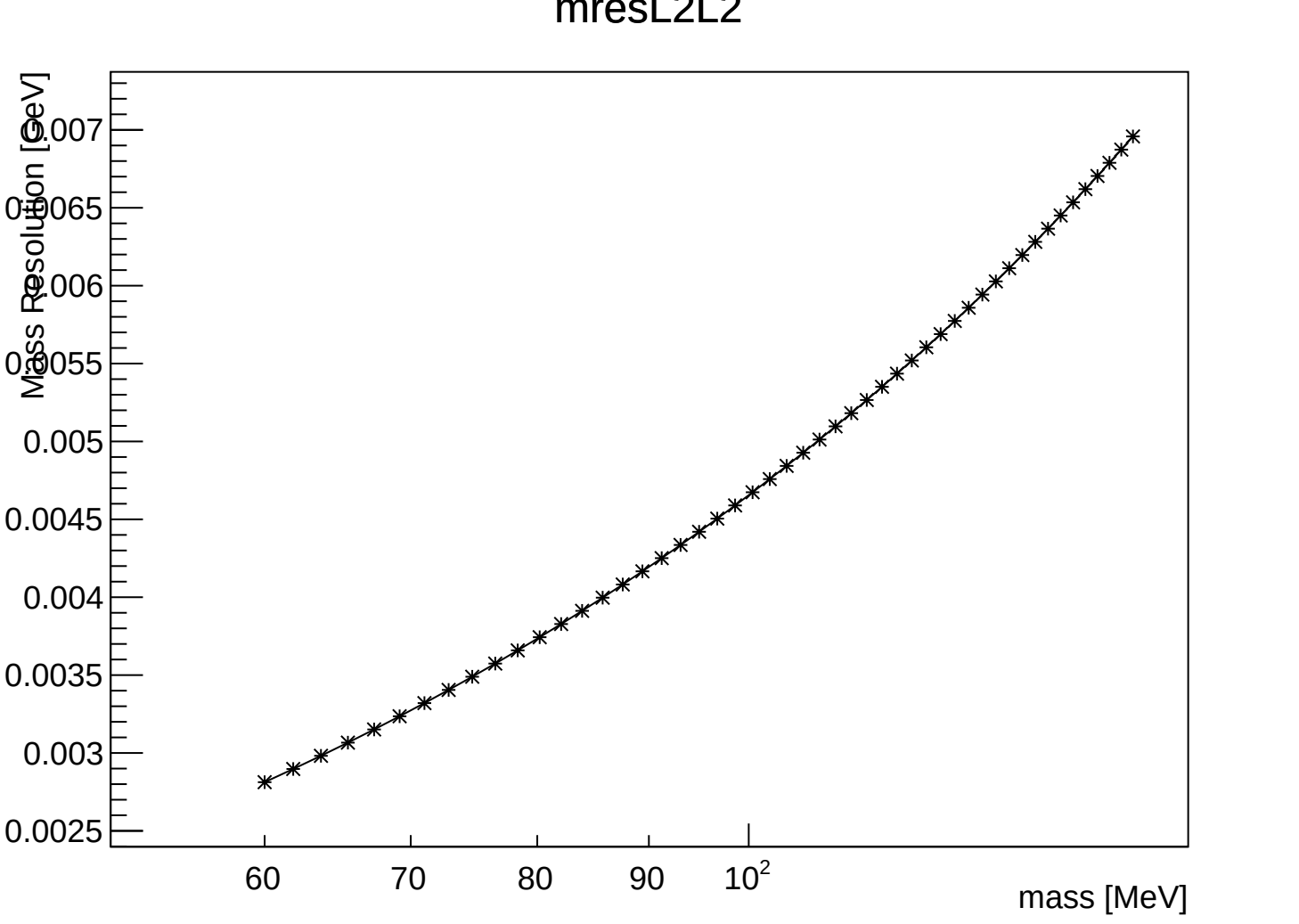

zcut L1L1 Data 10%
zcut [mm]
50
40
30
20
10
0
60
70
80
90
10^2
mass [MeV]
Biased
Unbiased

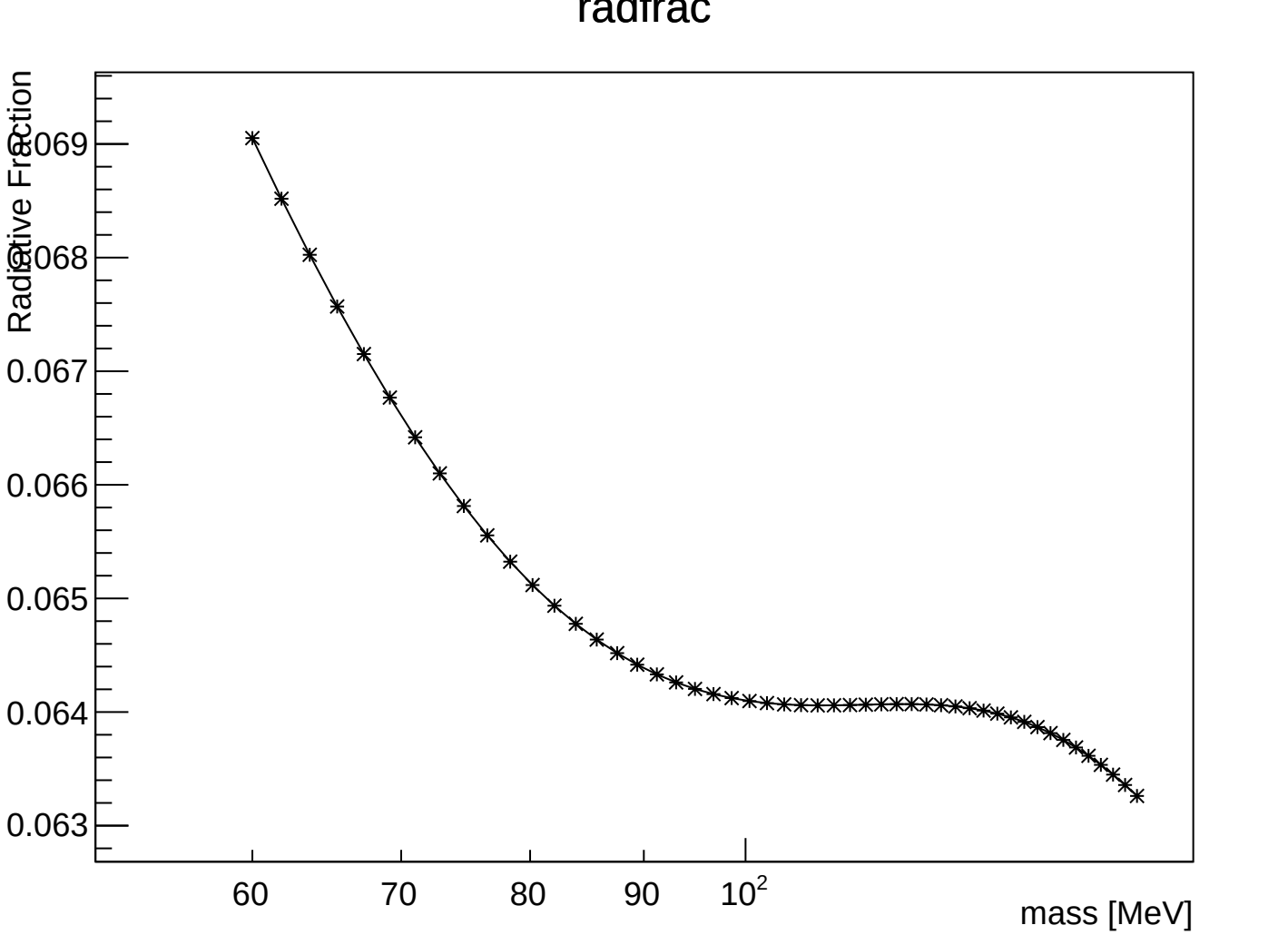

zcut L1L2 Data 10%
zcut [mm]
50
40
30
20
10
0
60
70
80
90
10^2
mass [MeV]
Biased
Unbiased

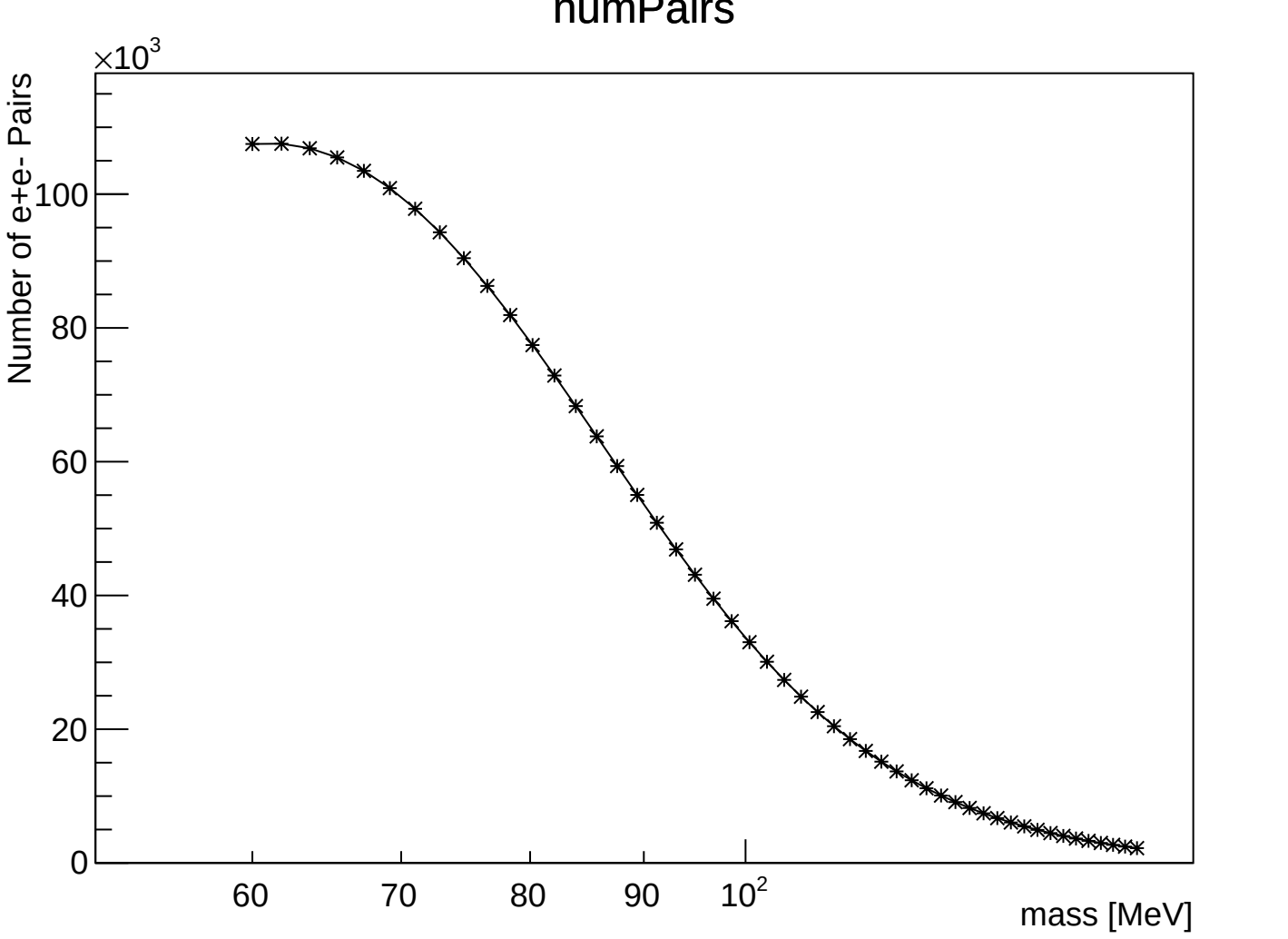

zcut L2L2 Data 10%
zcut [mm]
50
40
30
20
10
0
Biased
Unbiased
60
70
80
90
10^2
mass [MeV]

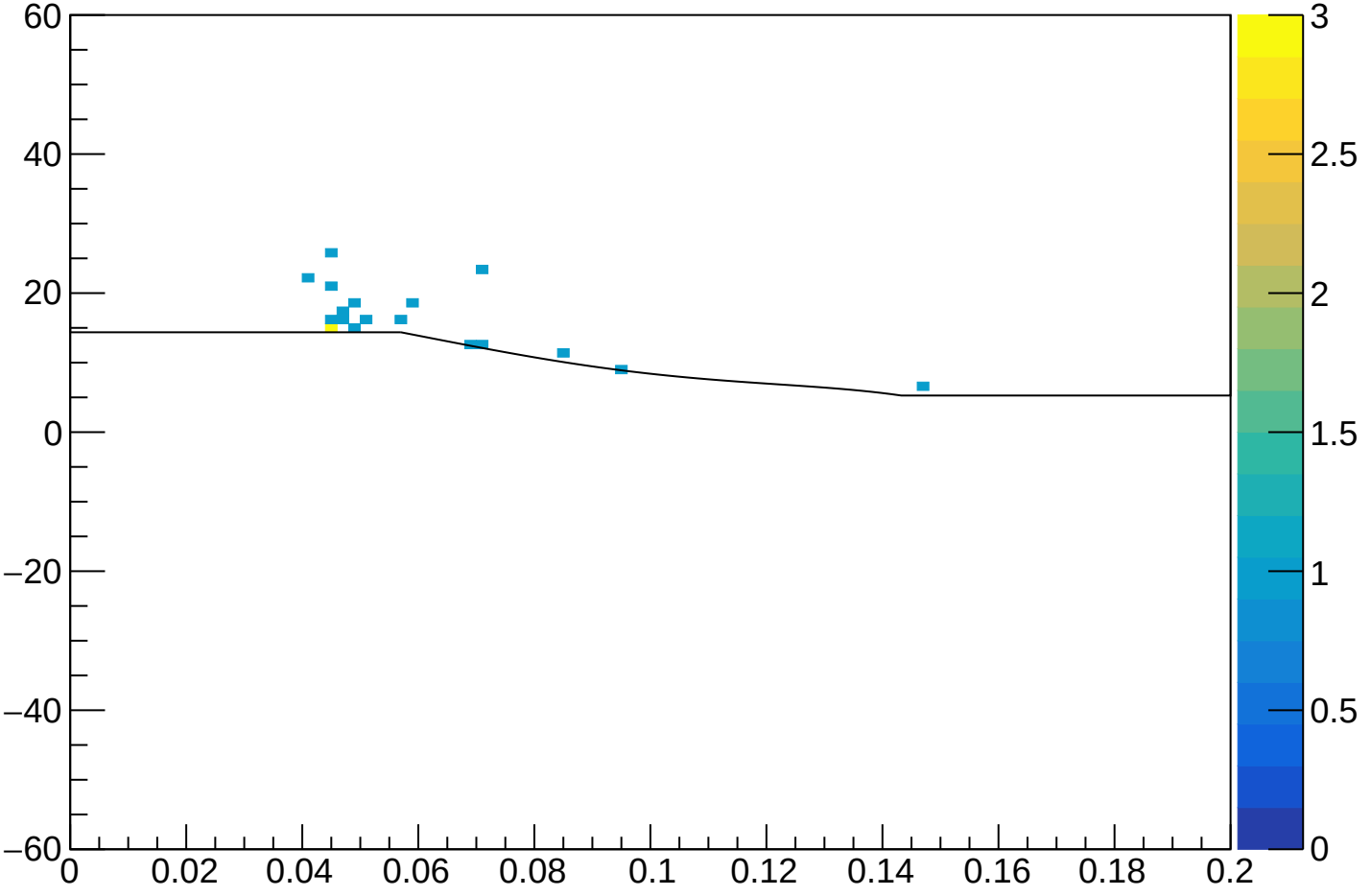

mres L1L1
Mass Resolution [GeV]
0.0075
0.007
0.0065
0.006
0.0055
0.005
0.0045
0.004
0.0035
0.003
60
70
80
90
10^2
mass [MeV]

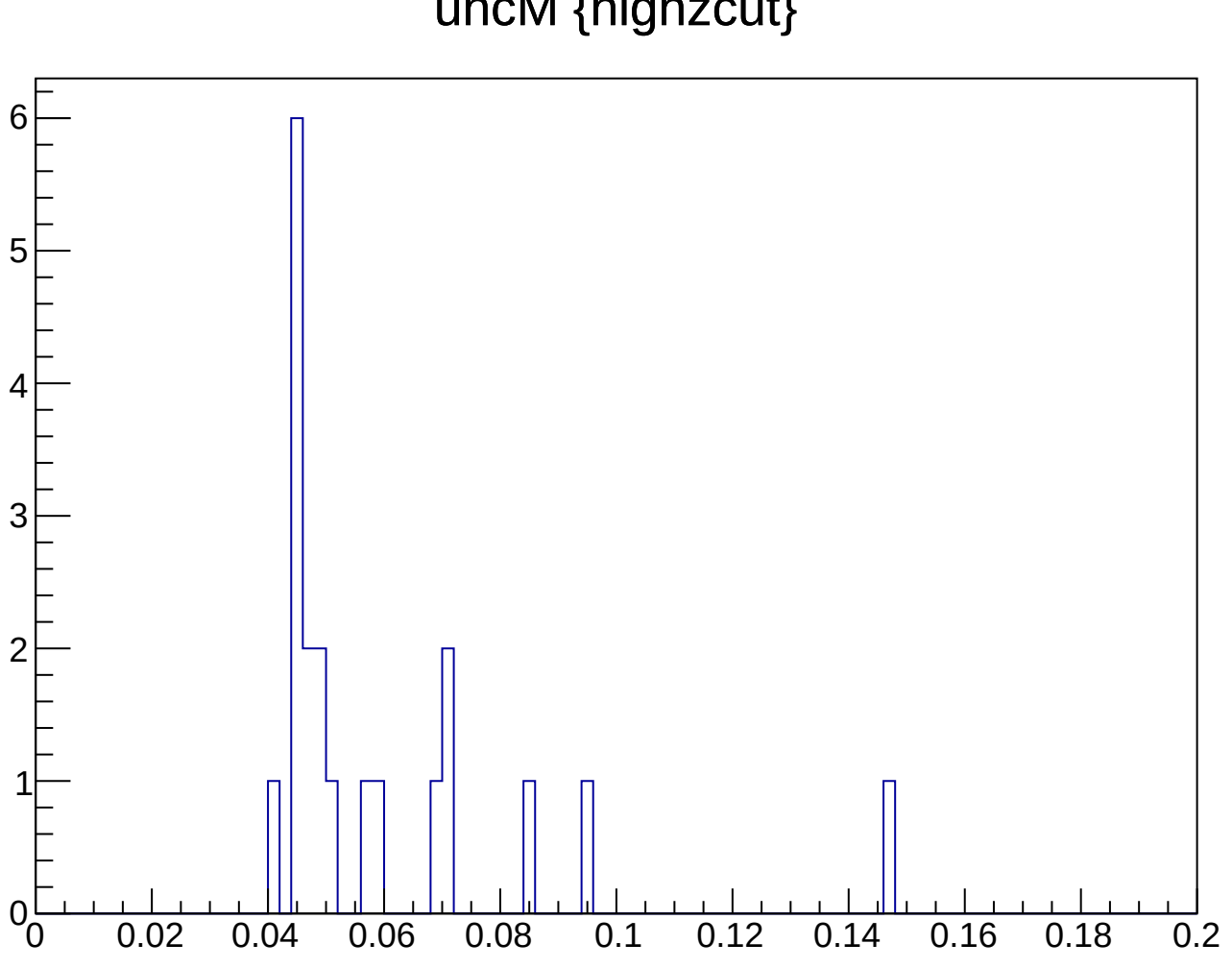

mresL1L2
Mass Resolution [GeV]
0.007
0.0065
0.006
0.0055
0.005
0.0045
0.004
0.0035
0.003
0.0025
60
70
80
90
10^2
mass [MeV]

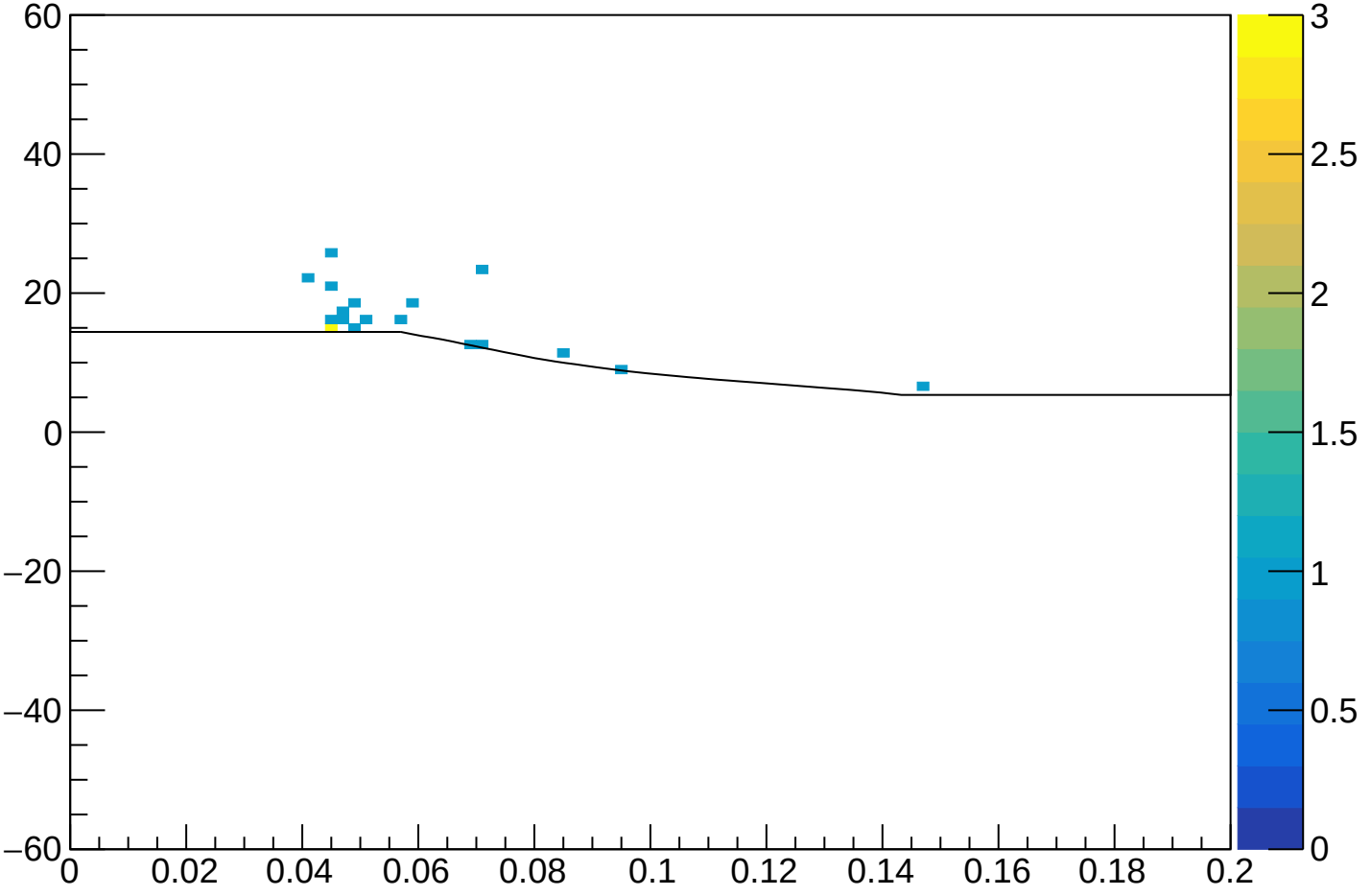

mresL2L2
Mass Resolution [GeV]
0.007
0.0065
0.006
0.0055
0.005
0.0045
0.004
0.0035
0.003
0.0025
60
70
80
90
10^2
mass [MeV]

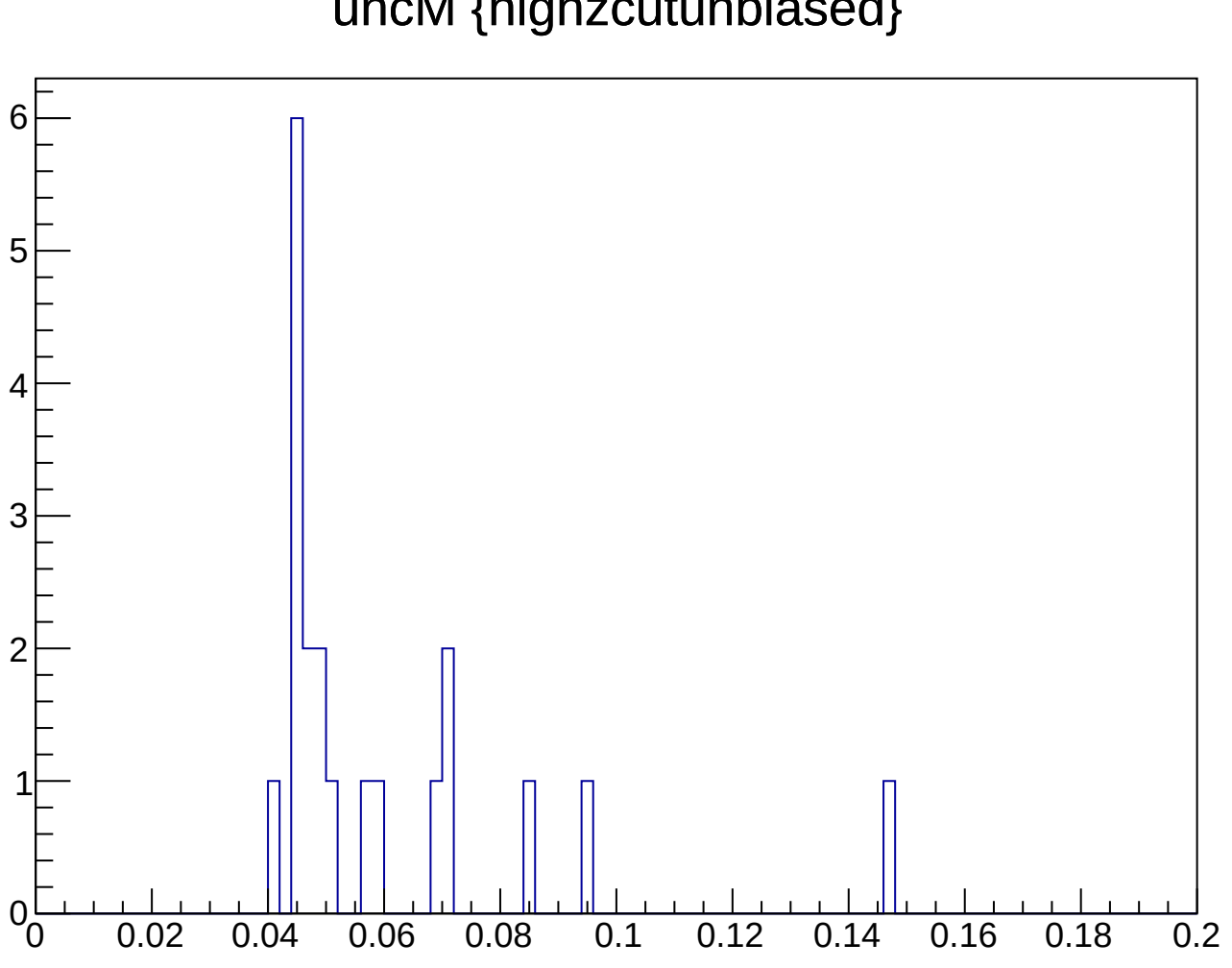

radfrac
Radiative Fraction
0.069
0.068
0.067
0.066
0.065
0.064
0.063
60
70
80
90
10^2
mass [MeV]

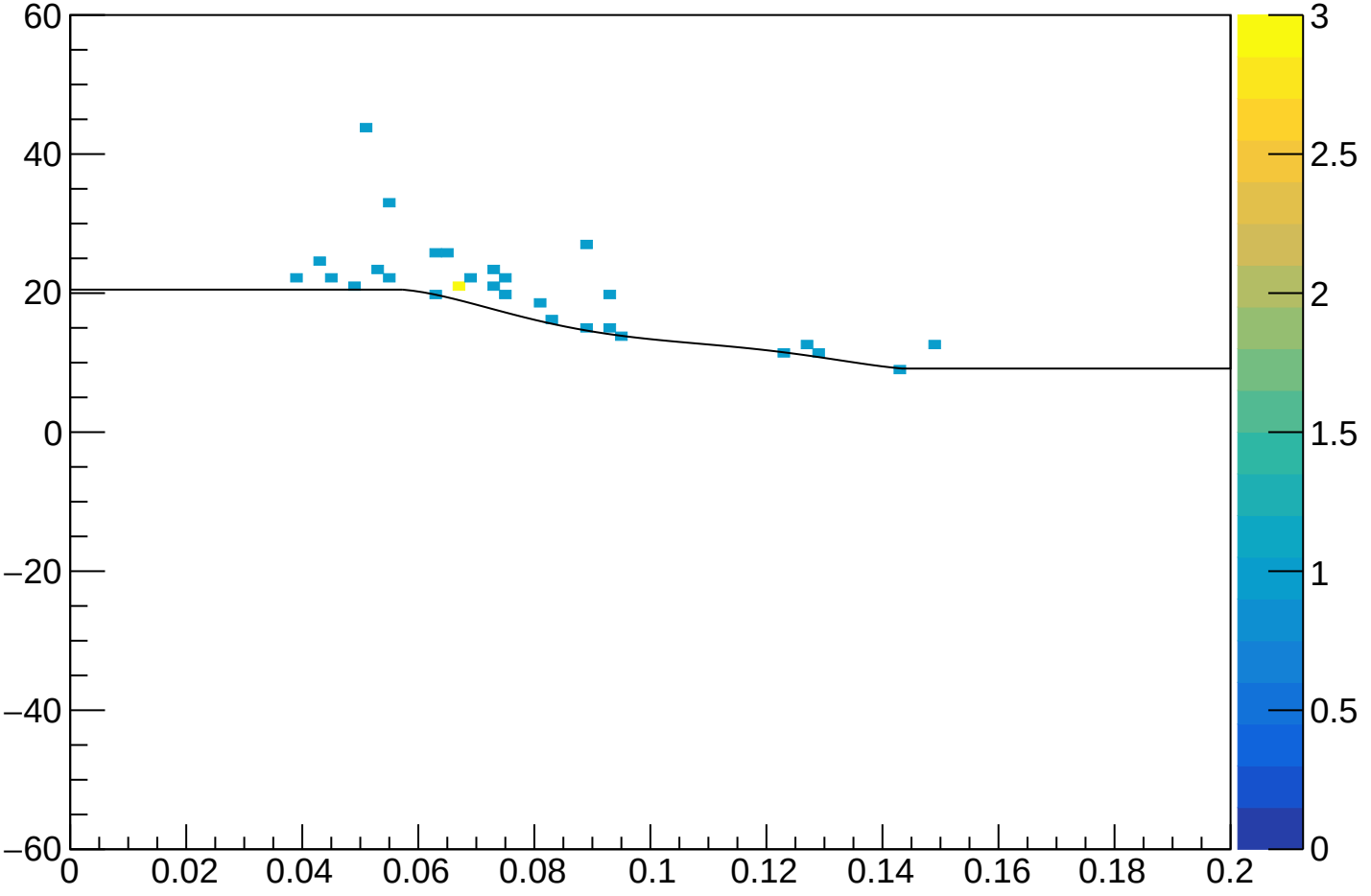

numPairs
×10^3
Number of e+e- Pairs
100
80
60
40
20
0
60
70
80
90
10^2
mass [MeV]

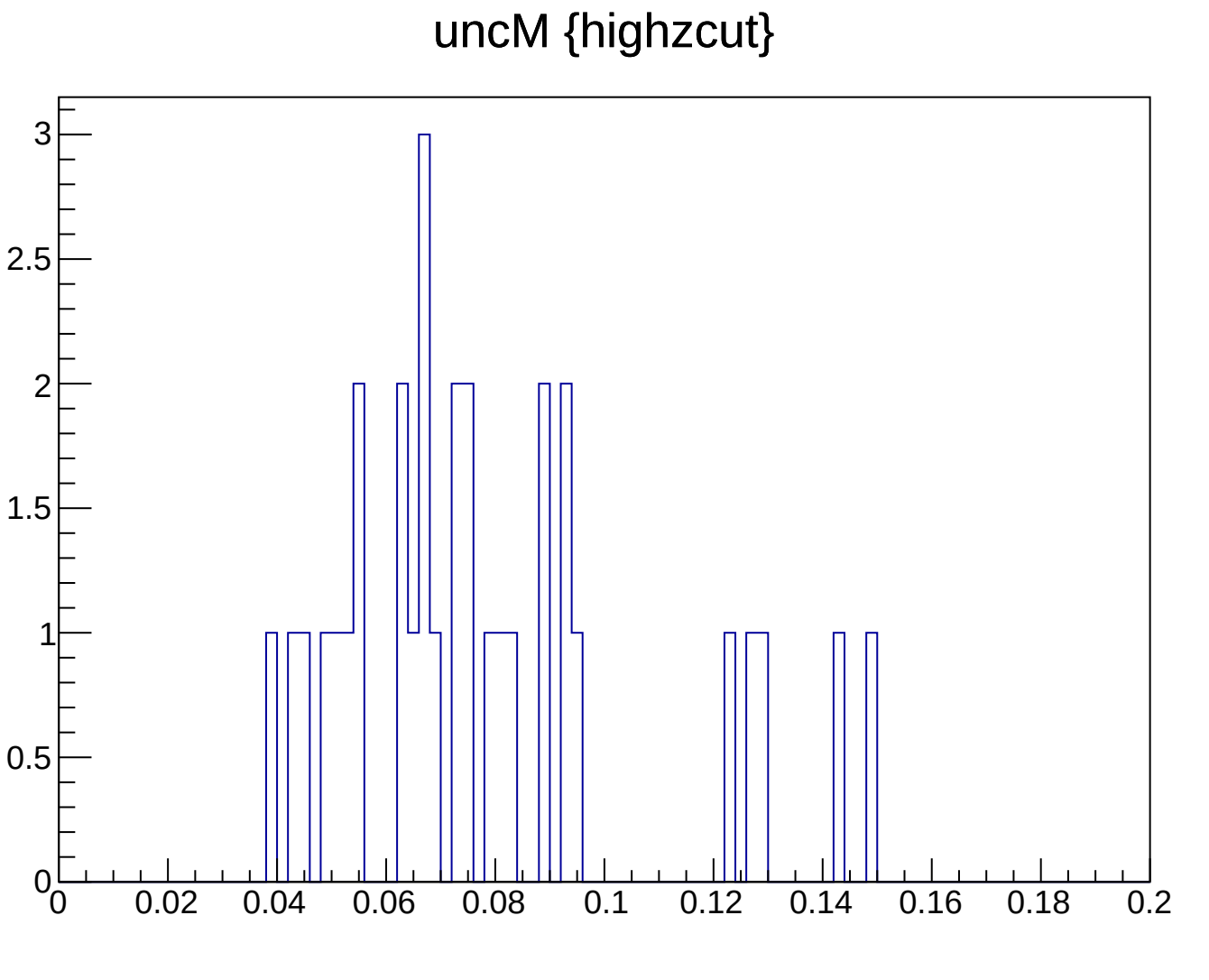

60
40
20
0
−20
−40
−60
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
3
2.5
2
1.5
1
0.5
0

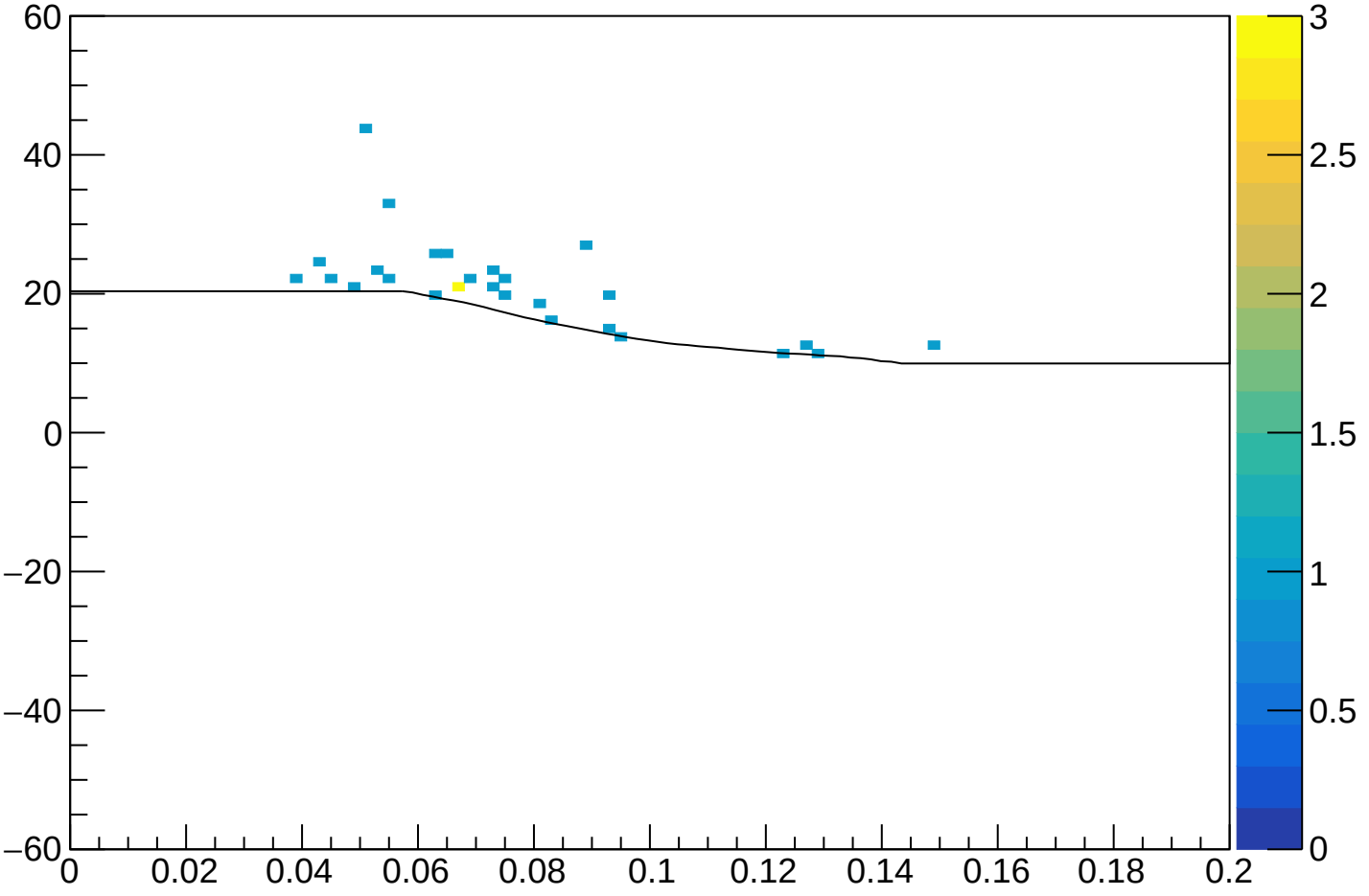

uncM {highzcut}
0
1
2
3
4
5
6
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

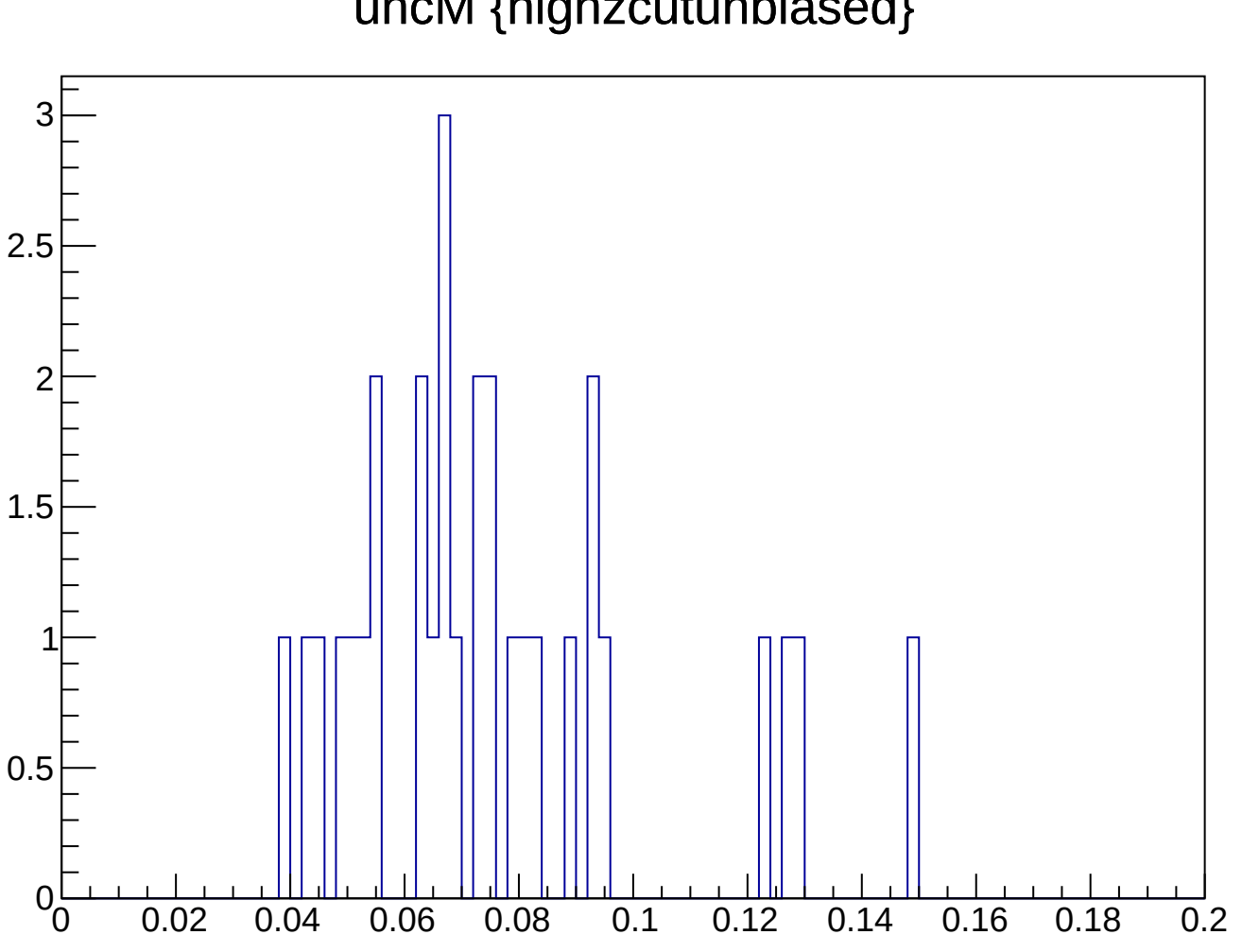

60
40
20
0
−20
−40
−60
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
3
2.5
2
1.5
1
0.5
0

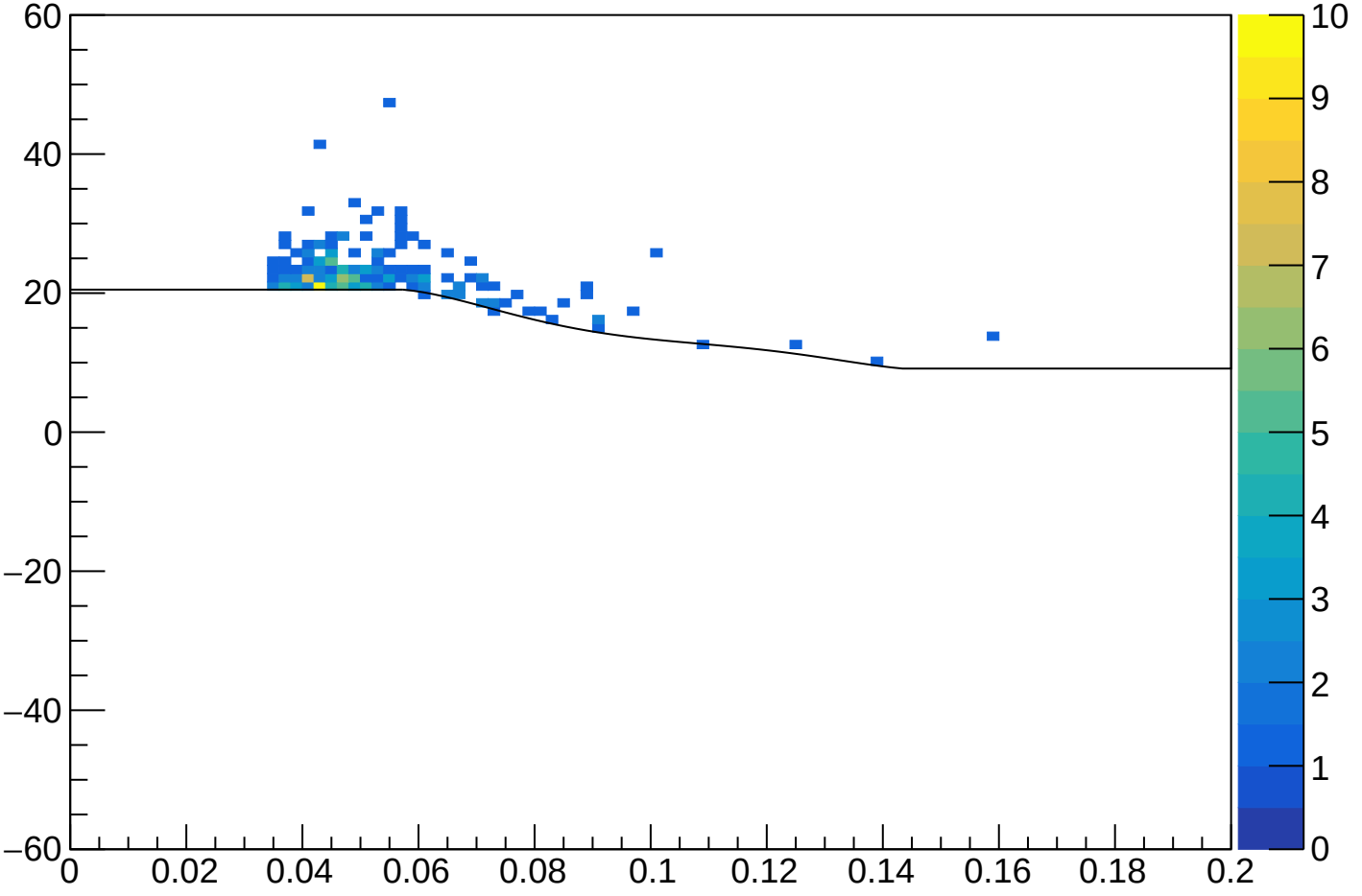

uncM {highzcutunbiased}
6
5
4
3
2
1
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

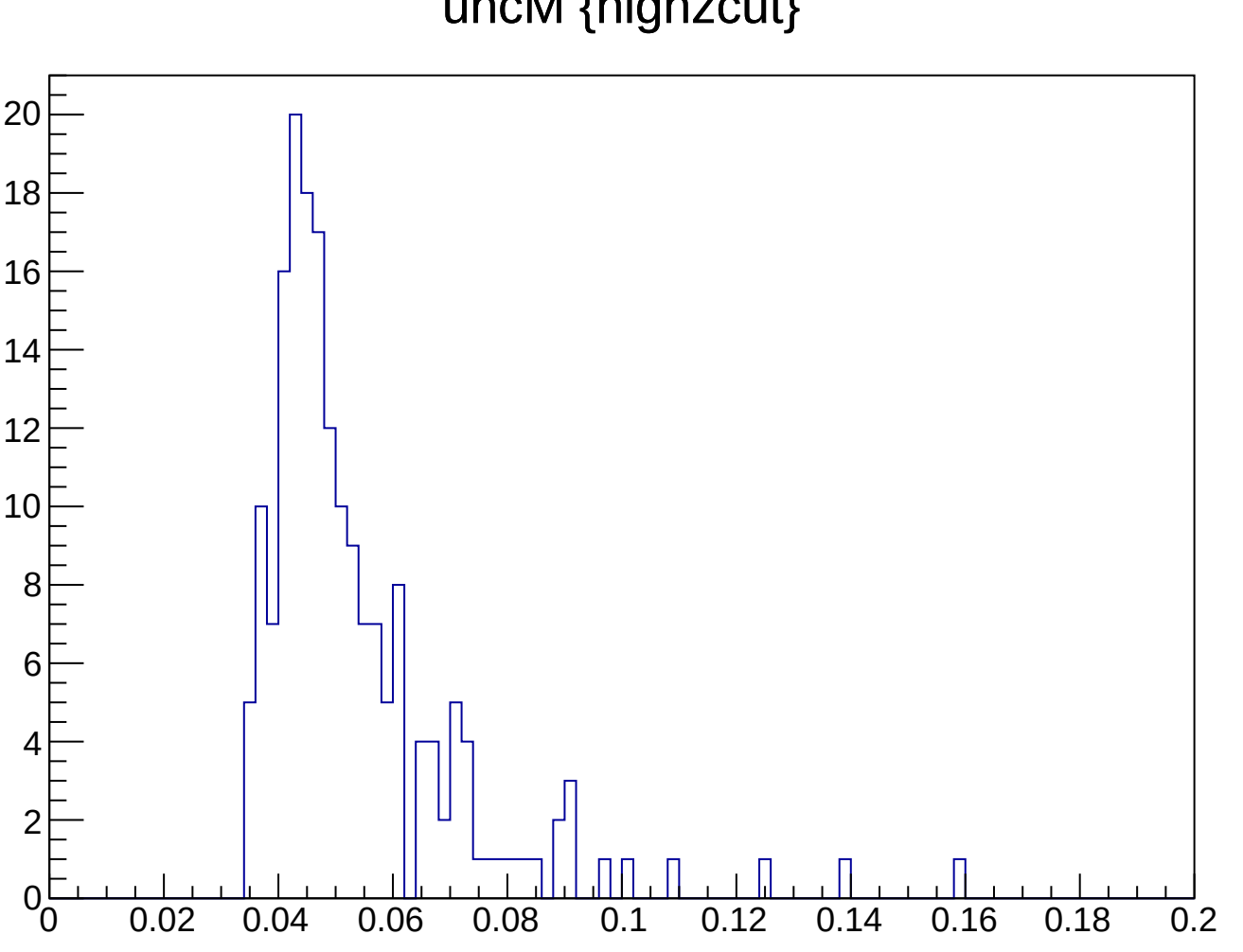

60
40
20
0
−20
−40
−60
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
3
2.5
2
1.5
1
0.5
0

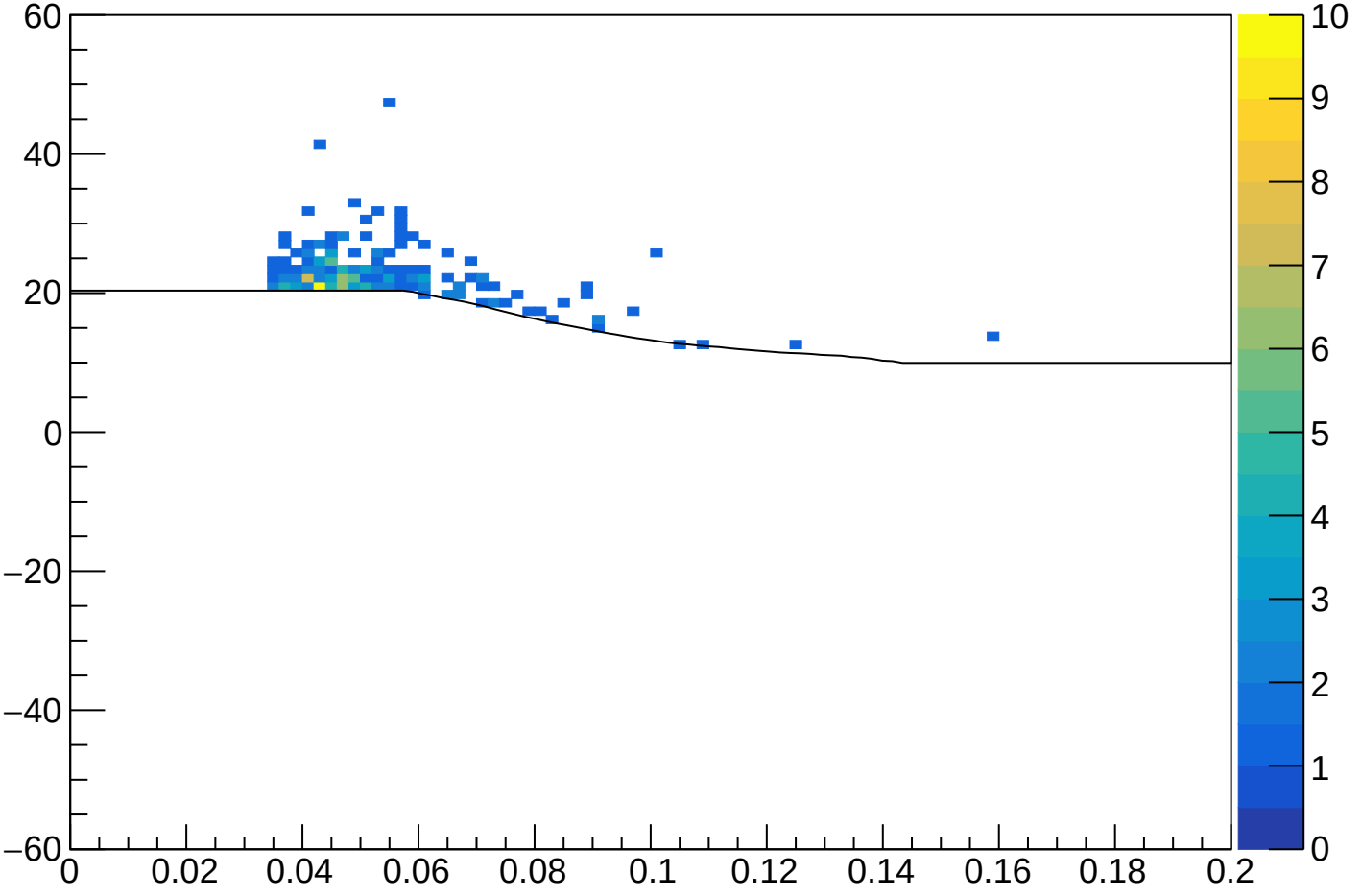

uncM {highzcut}
3
2.5
2
1.5
1
0.5
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

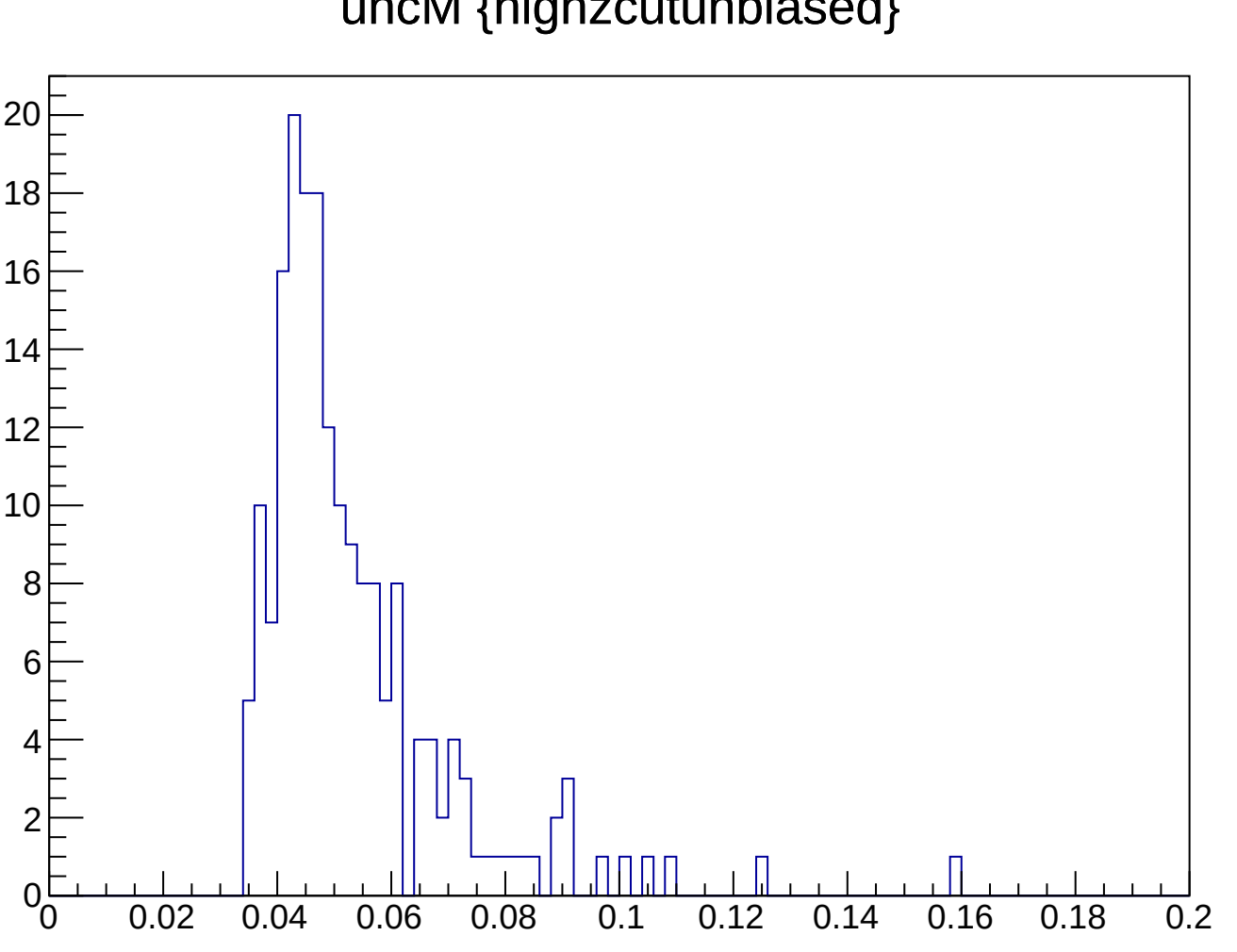

60
40
20
0
−20
−40
−60
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
3
2.5
2
1.5
1
0.5
0

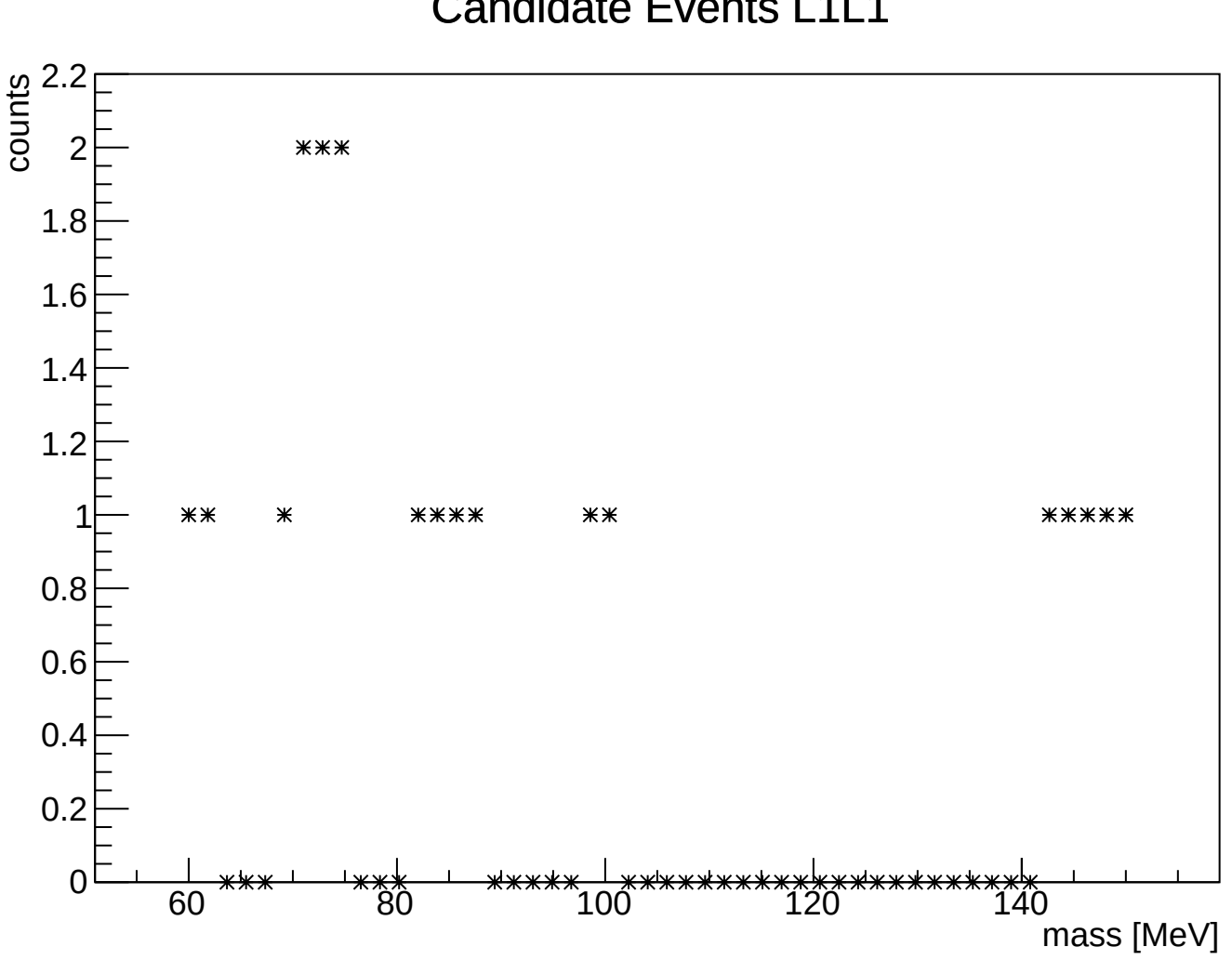

uncM {highzcutunbiased}
3
2.5
2
1.5
1
0.5
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

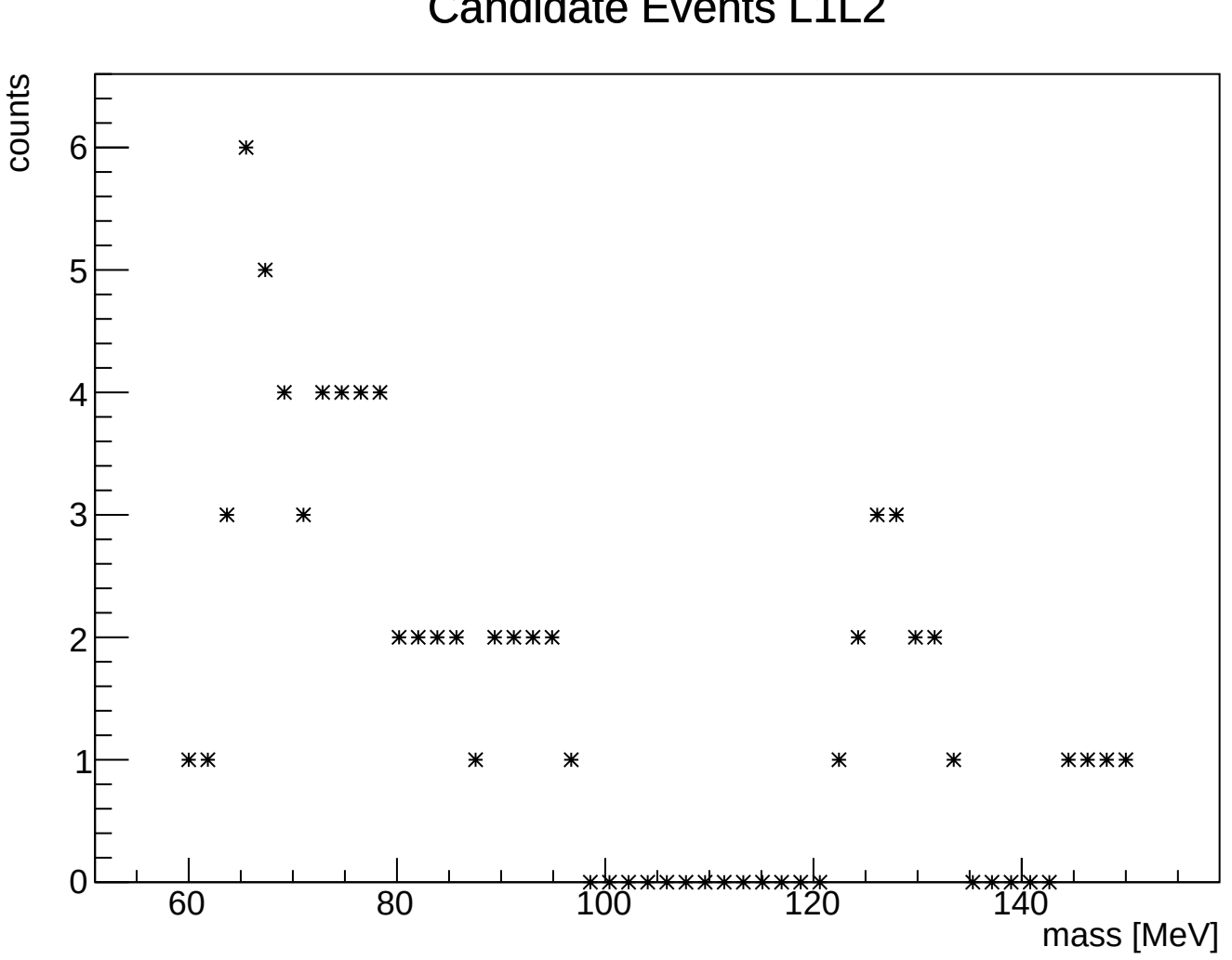

60
40
20
0
−20
−40
−60
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
10
9
8
7
6
5
4
3
2
1
0

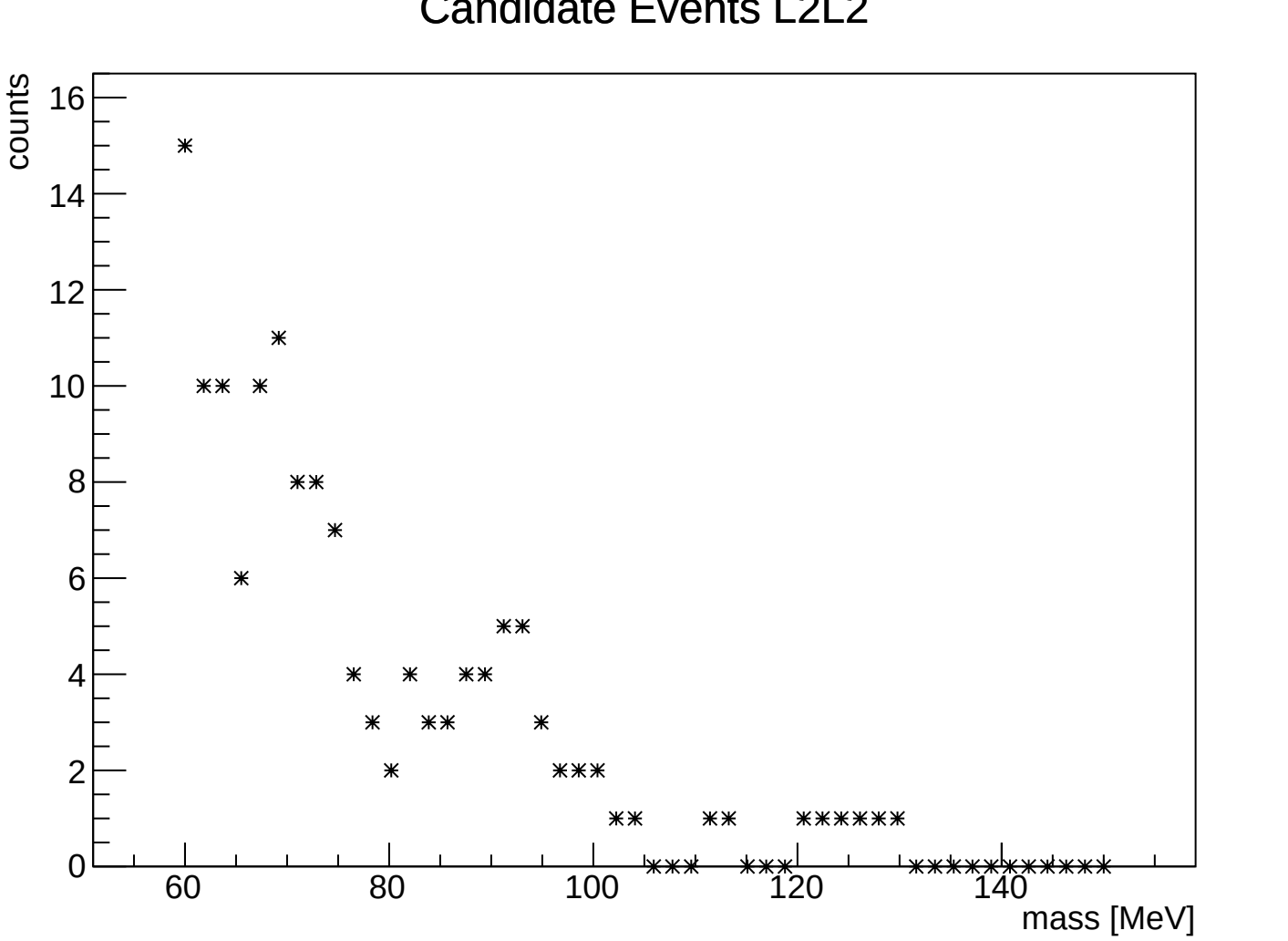

uncM {highzcut}
20
18
16
14
12
10
8
6
4
2
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

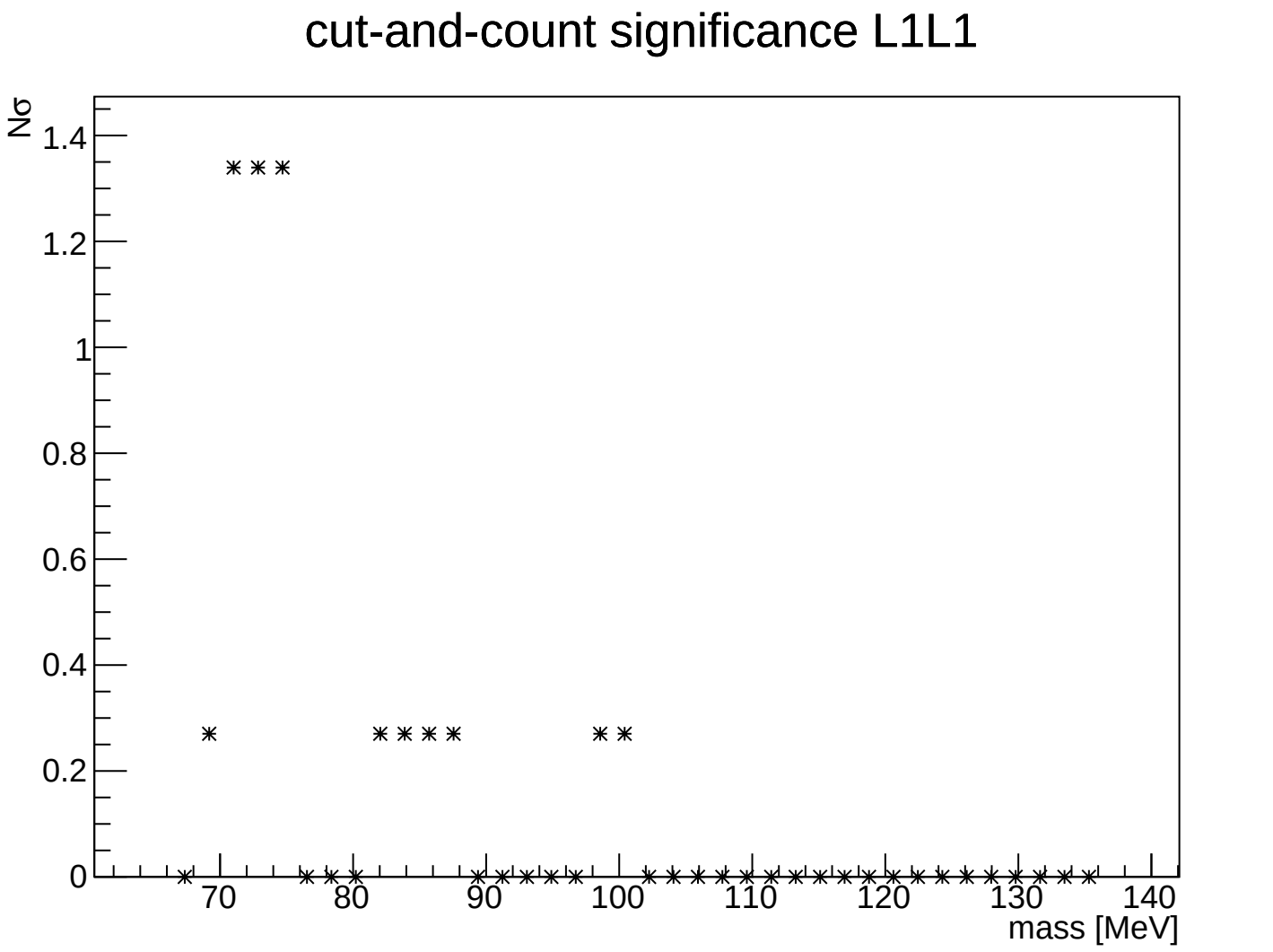

60
40
20
0
−20
−40
−60
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
10
9
8
7
6
5
4
3
2
1
0

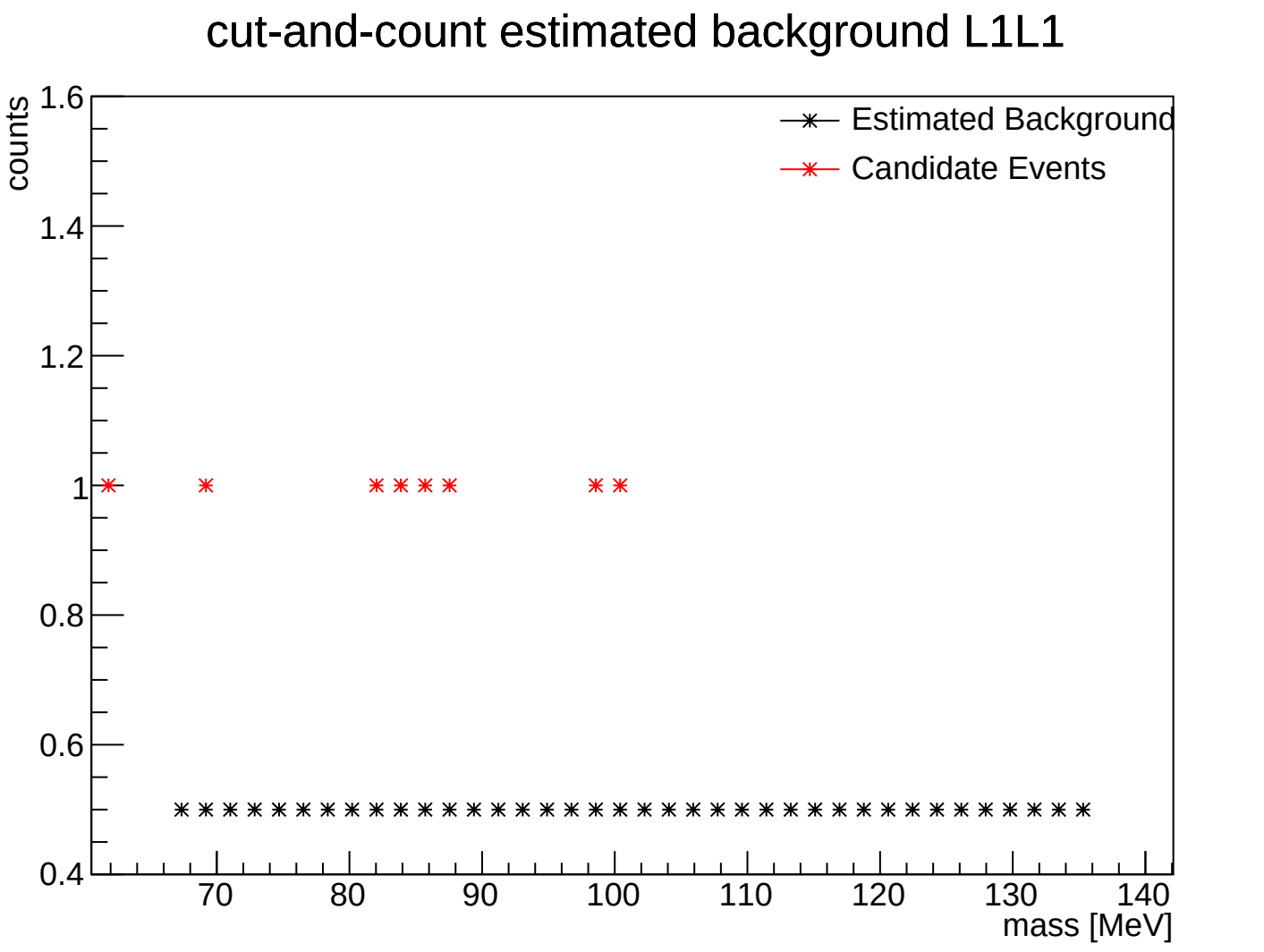

uncM {highzcutunbiased}
20
18
16
14
12
10
8
6
4
2
0
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2

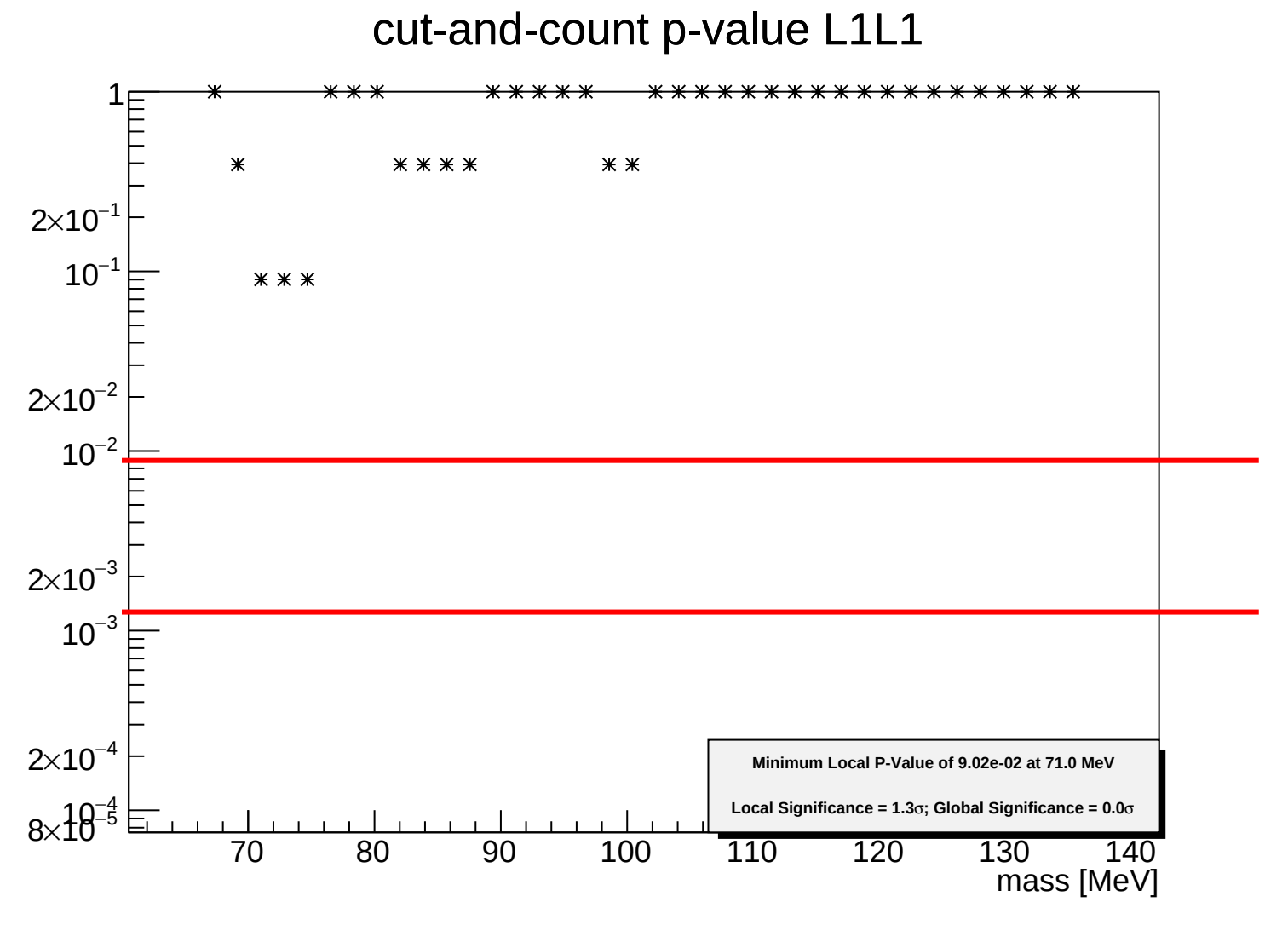

Candidate Events L1L1
counts
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
60
80
100
120
140
mass [MeV]

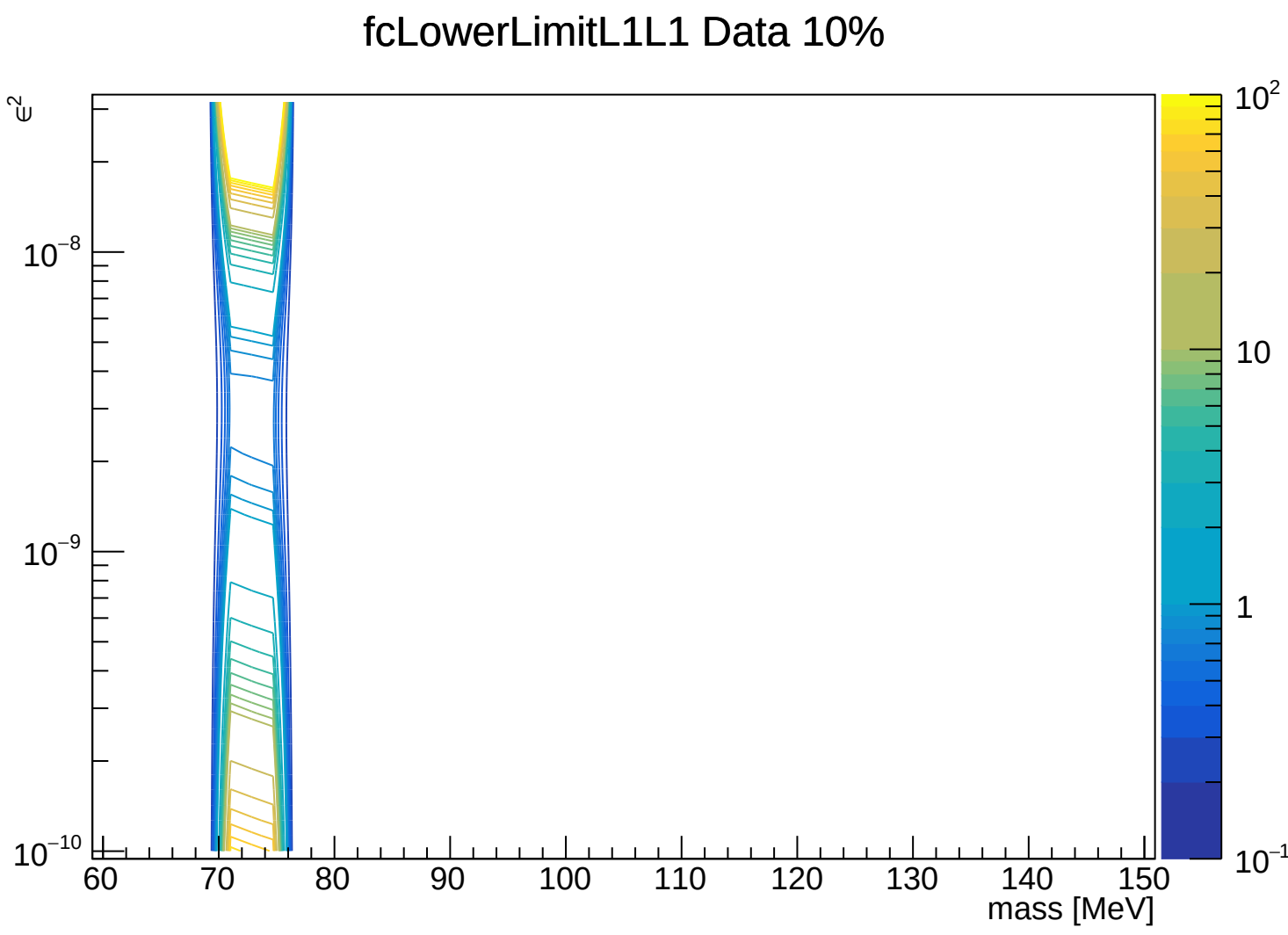

Candidate Events L1L2
counts
0
1
2
3
4
5
6
60
80
100
120
140
mass [MeV]

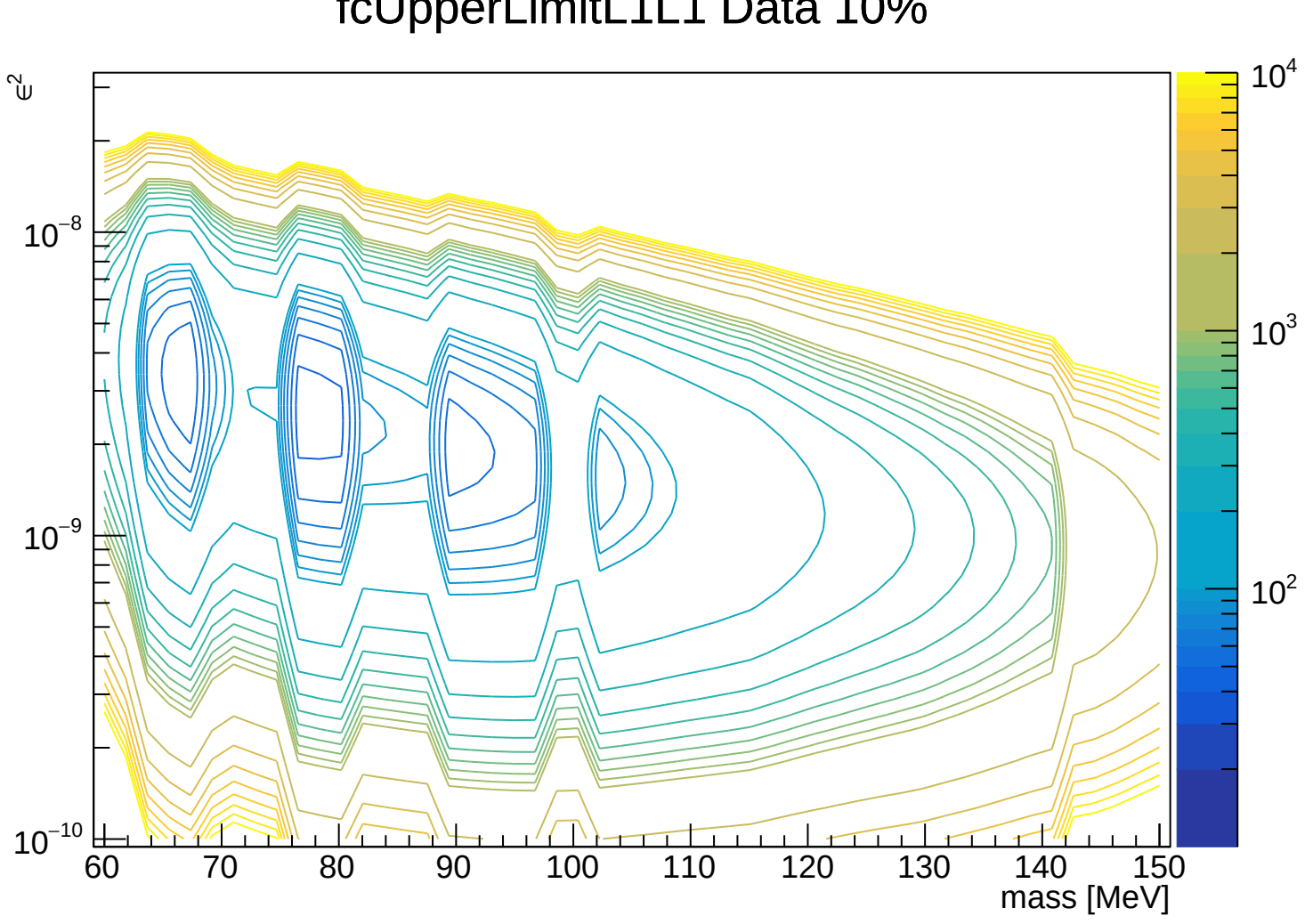

Candidate Events L2L2
counts
0
2
4
6
8
10
12
14
16
60
80
100
120
140
mass [MeV]

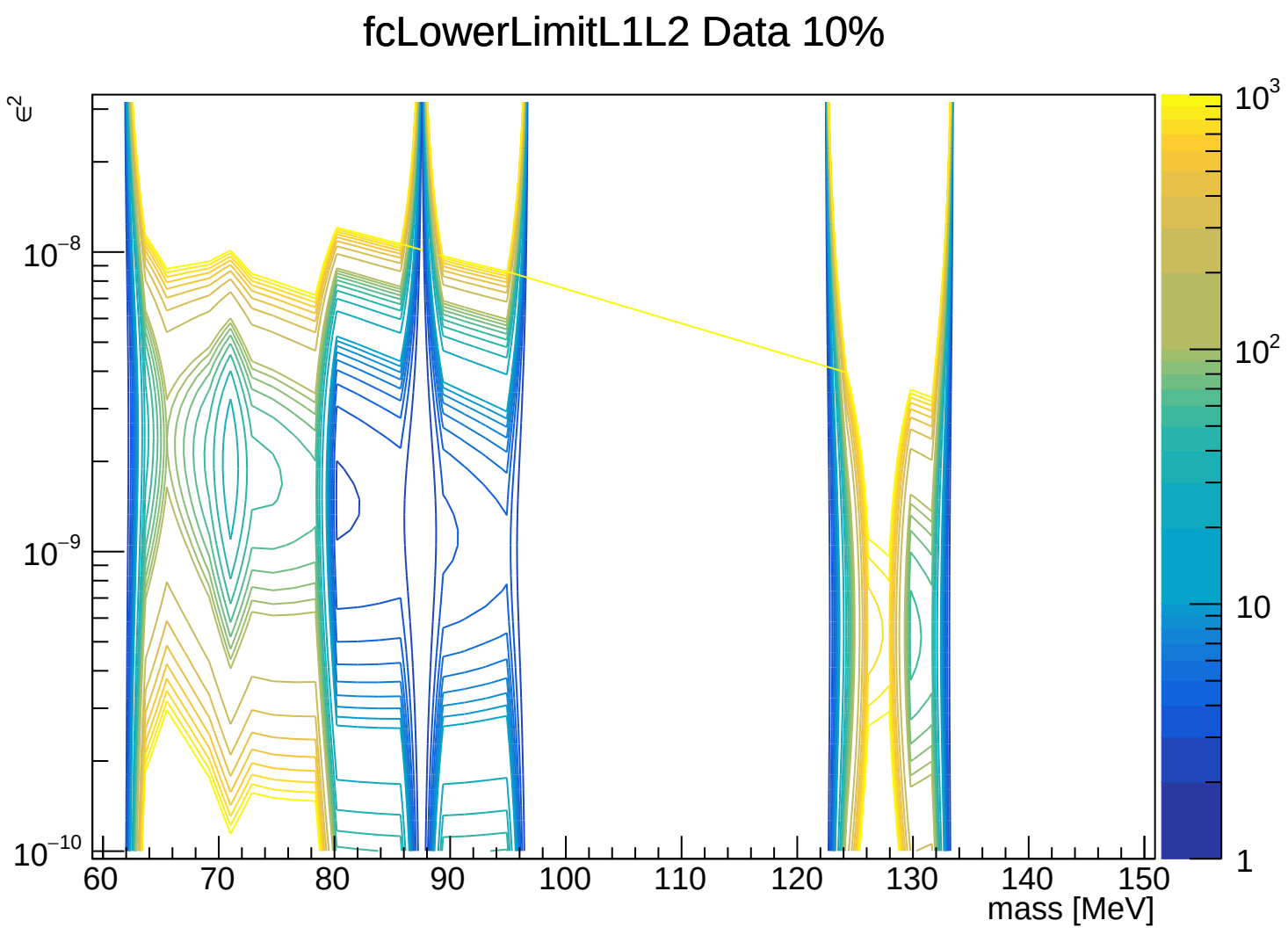

cut-and-count significance L1L1
Nσ
1.4
1.2
1
0.8
0.6
0.4
0.2
0
70
80
90
100
110
120
130
140
mass [MeV]

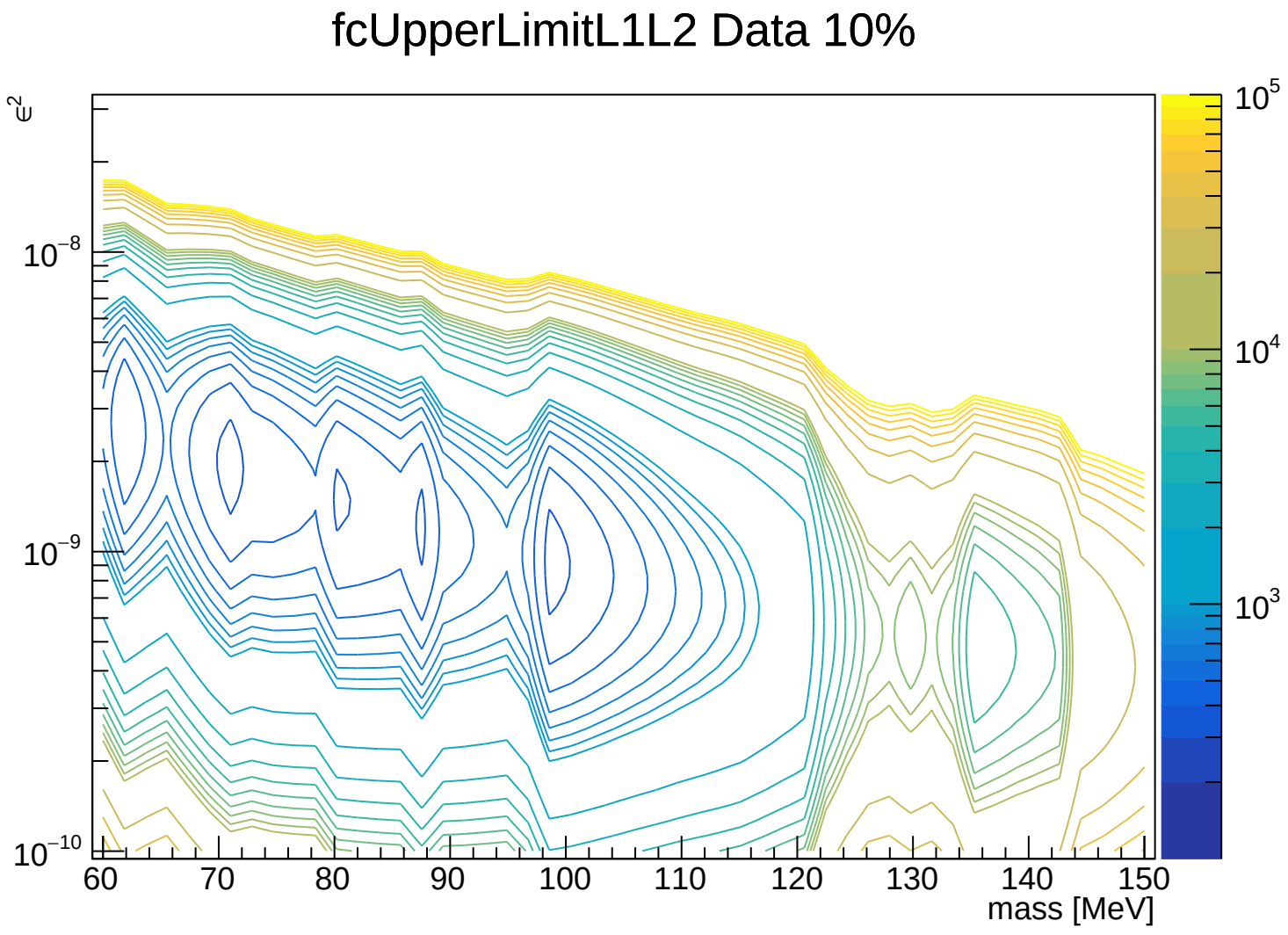

cut-and-count estimated background L1L1
counts
1.6
1.4
1.2
1
0.8
0.6
0.4
70
80
90
100
110
120
130
140
mass [MeV]
Estimated Background
Candidate Events

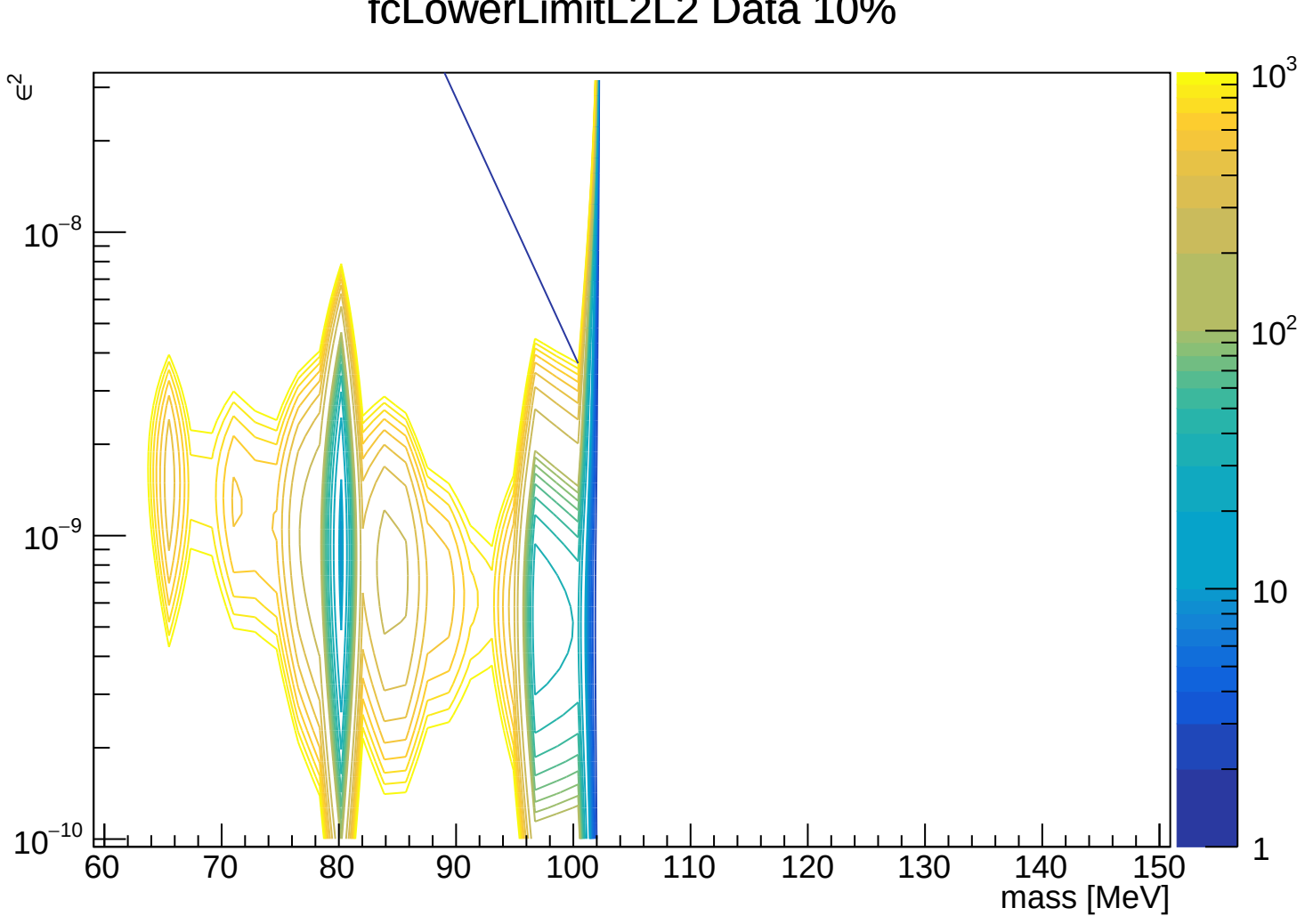

cut-and-count p-value L1L1
1
2×10⁻¹
10⁻¹
2×10⁻²
10⁻²
2×10⁻³
10⁻³
2×10⁻⁴
10⁻⁴
8×10⁻⁵
70
80
90
100
110
120
130
140
mass [MeV]
Minimum Local P-Value of 9.02e-02 at 71.0 MeV
Local Significance = 1.3σ; Global Significance = 0.0σ

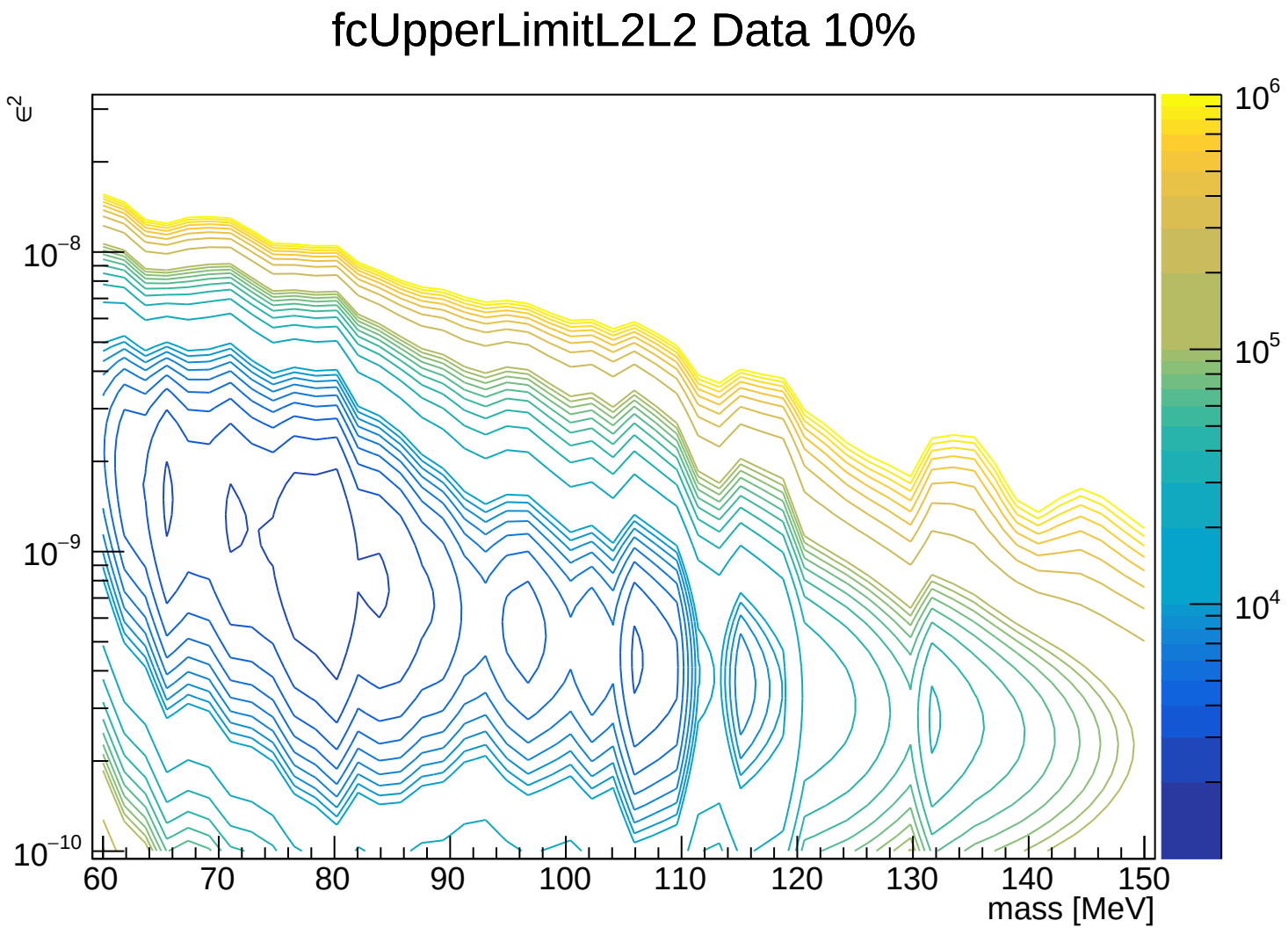

fcLowerLimitL1L1 Data 10%
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10²
10
1
10⁻¹

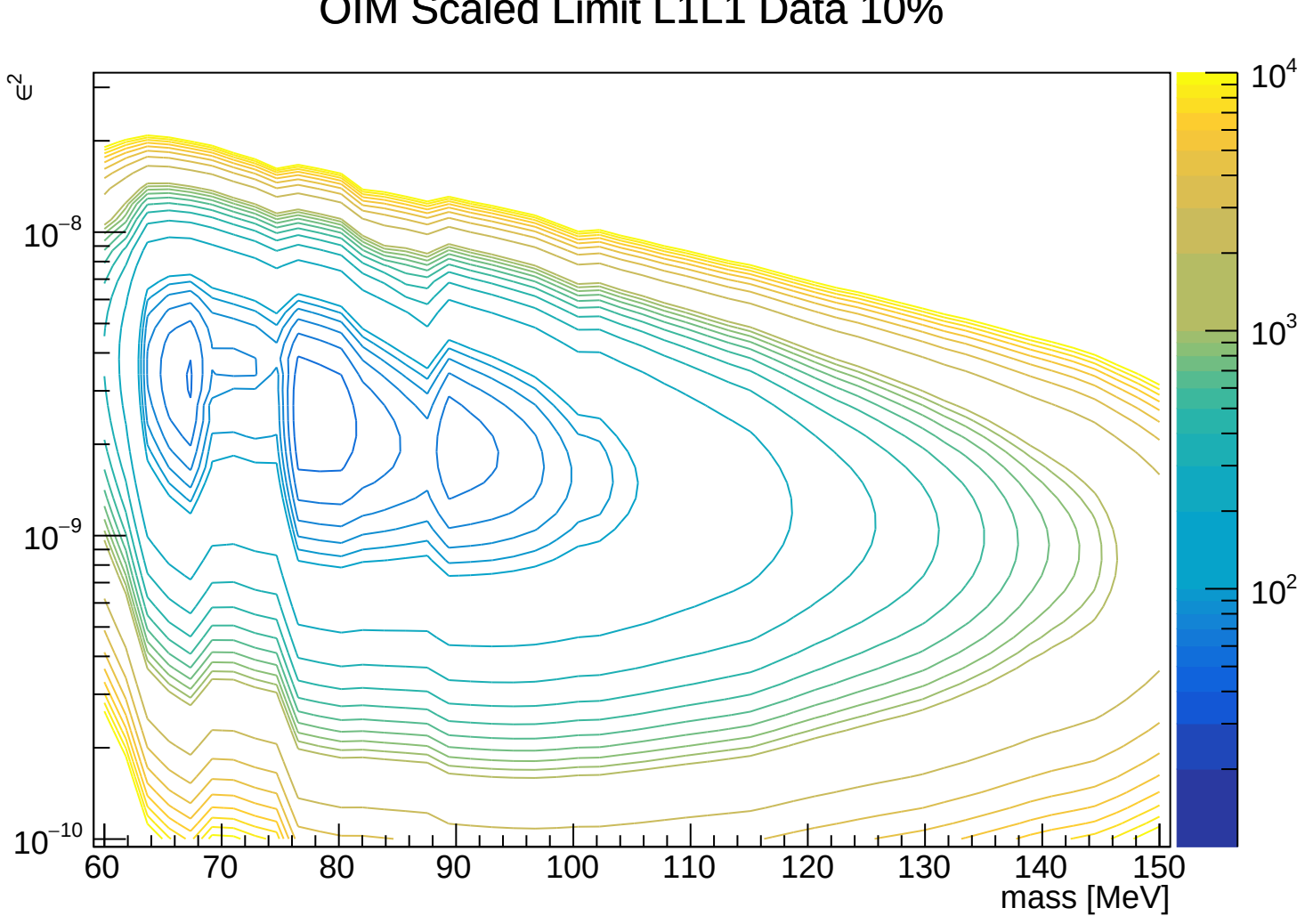

fcUpperLimitL1L1 Data 10%
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10⁴
10³
10²

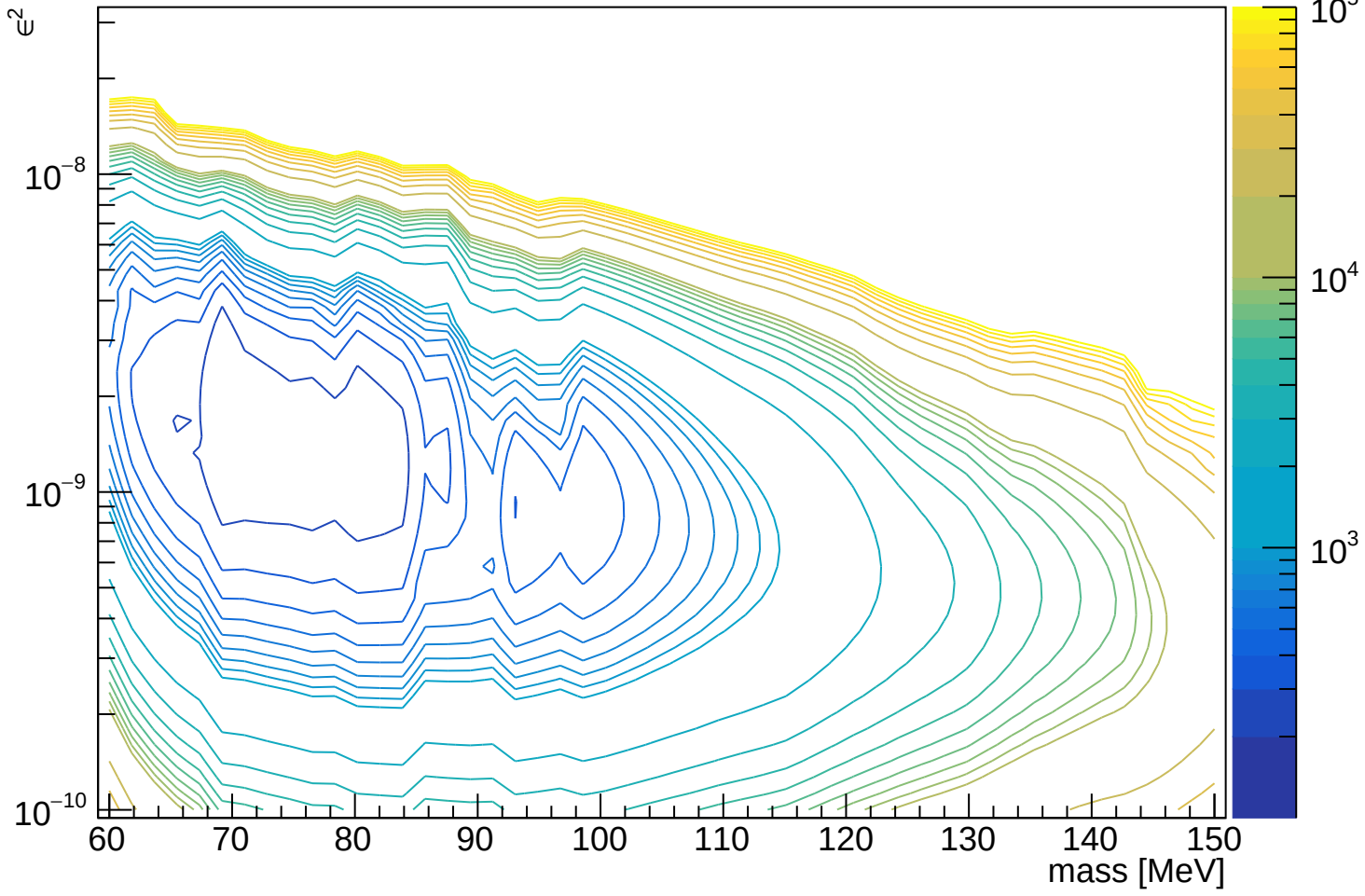

fcLowerLimitL1L2 Data 10%
ε²
10^-8
10^-9
10^-10
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10^3
10^2
10
1

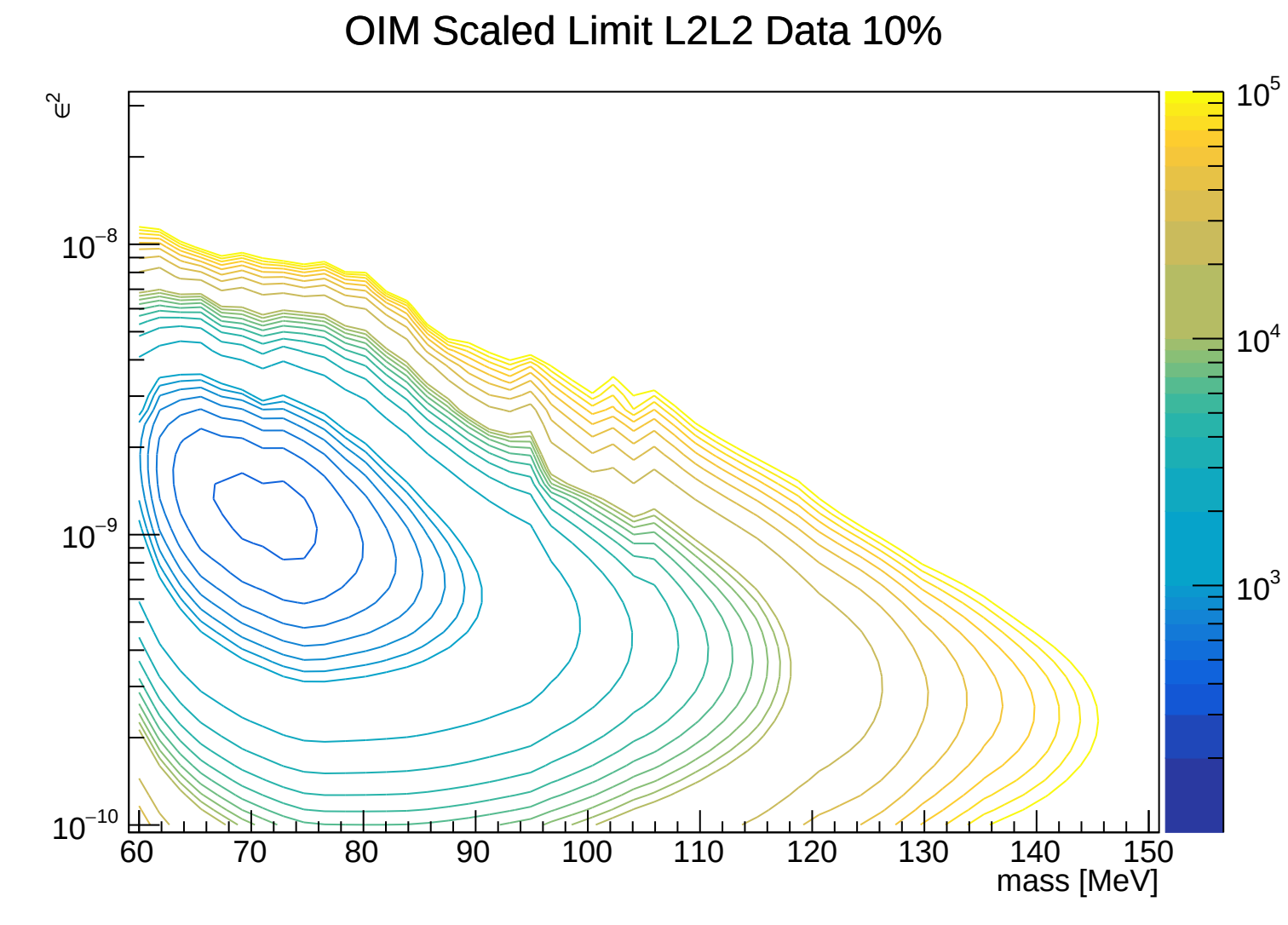

fcUpperLimitL1L2 Data 10%
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10⁵
10⁴
10³

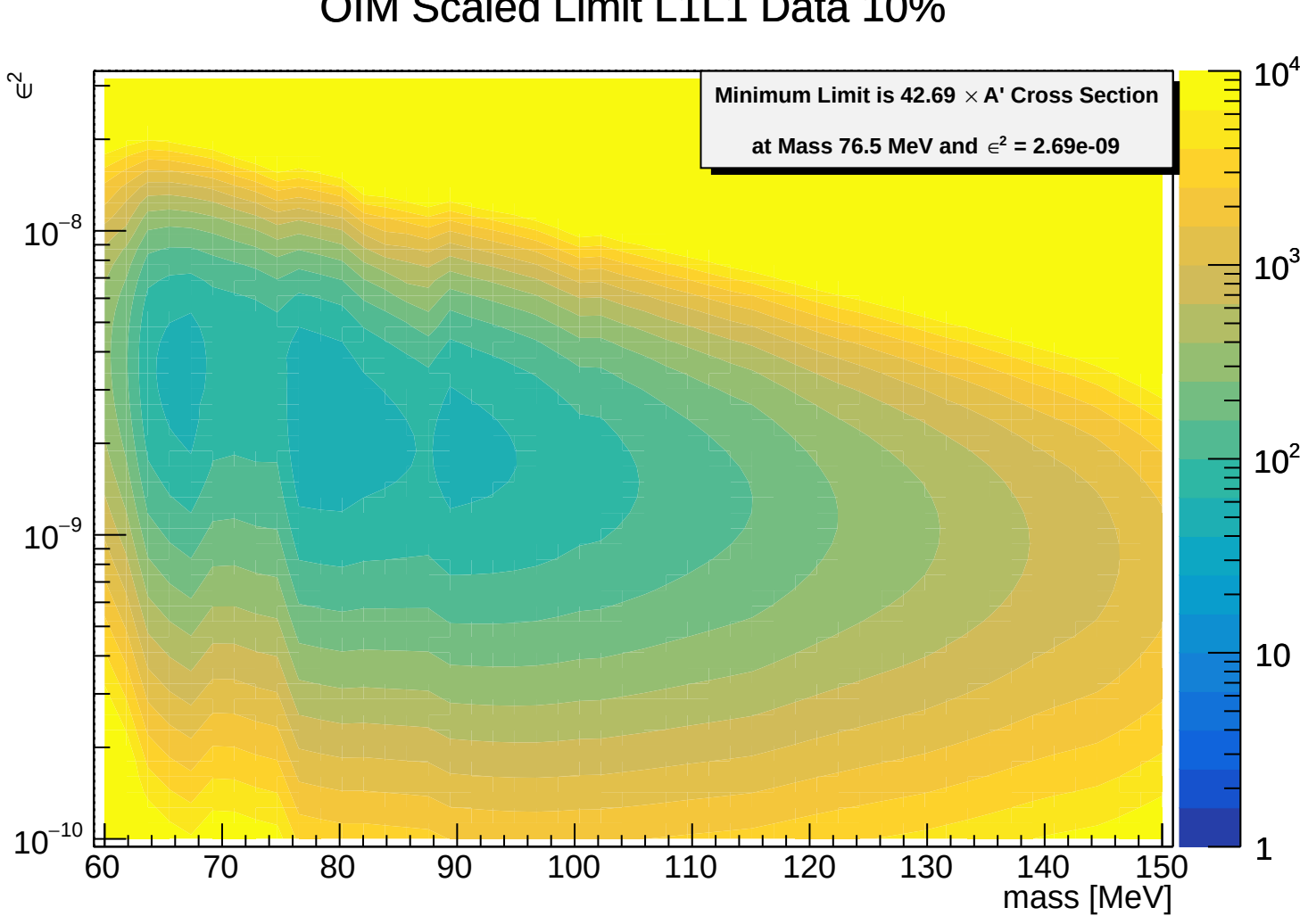

fcLowerLimitL2L2 Data 10%
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10³
10²
10
1


fcUpperLimitL2L2 Data 10%
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10⁶
10⁵
10⁴

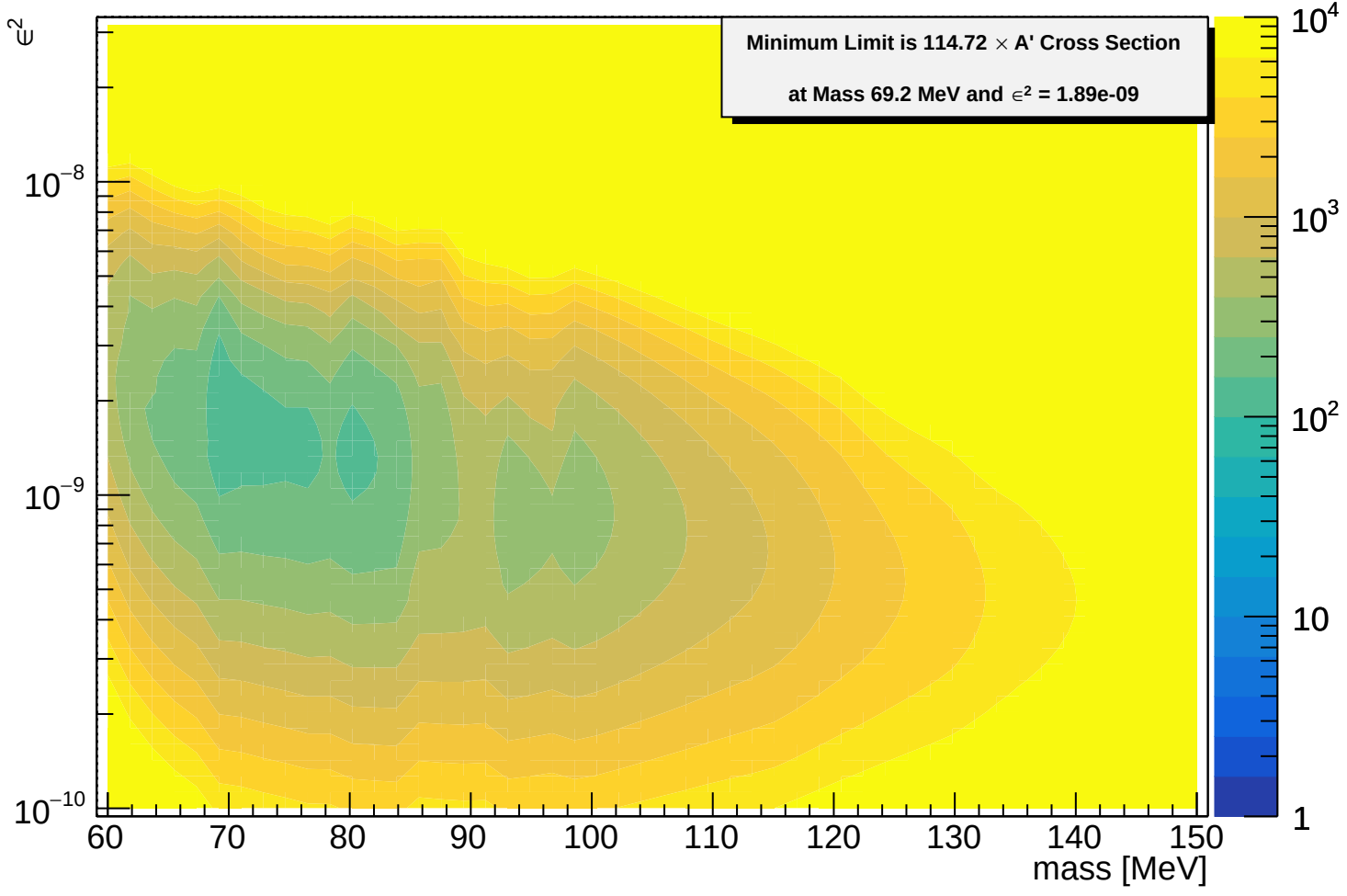

OIM Scaled Limit L1L1 Data 10%
ϵ^2
10^{-8}
10^{-9}
10^{-10}
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10^4
10^3
10^2

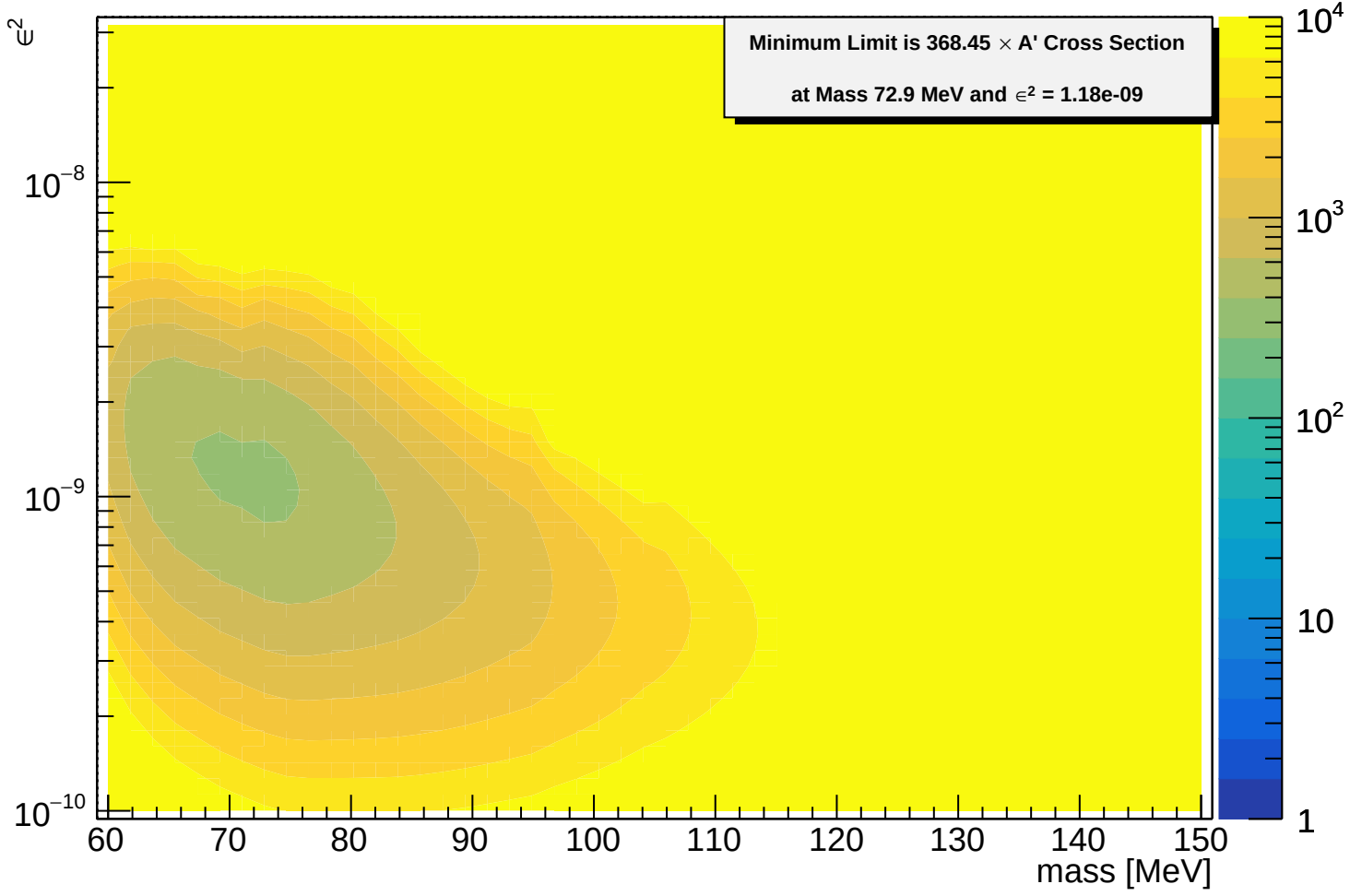

OIM Scaled limit L1L2 Data 10%
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10⁵
10⁴
10³


OIM Scaled Limit L2L2 Data 10%
ϵ^2
10^{-8}
10^{-9}
10^{-10}
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10^5
10^4
10^3

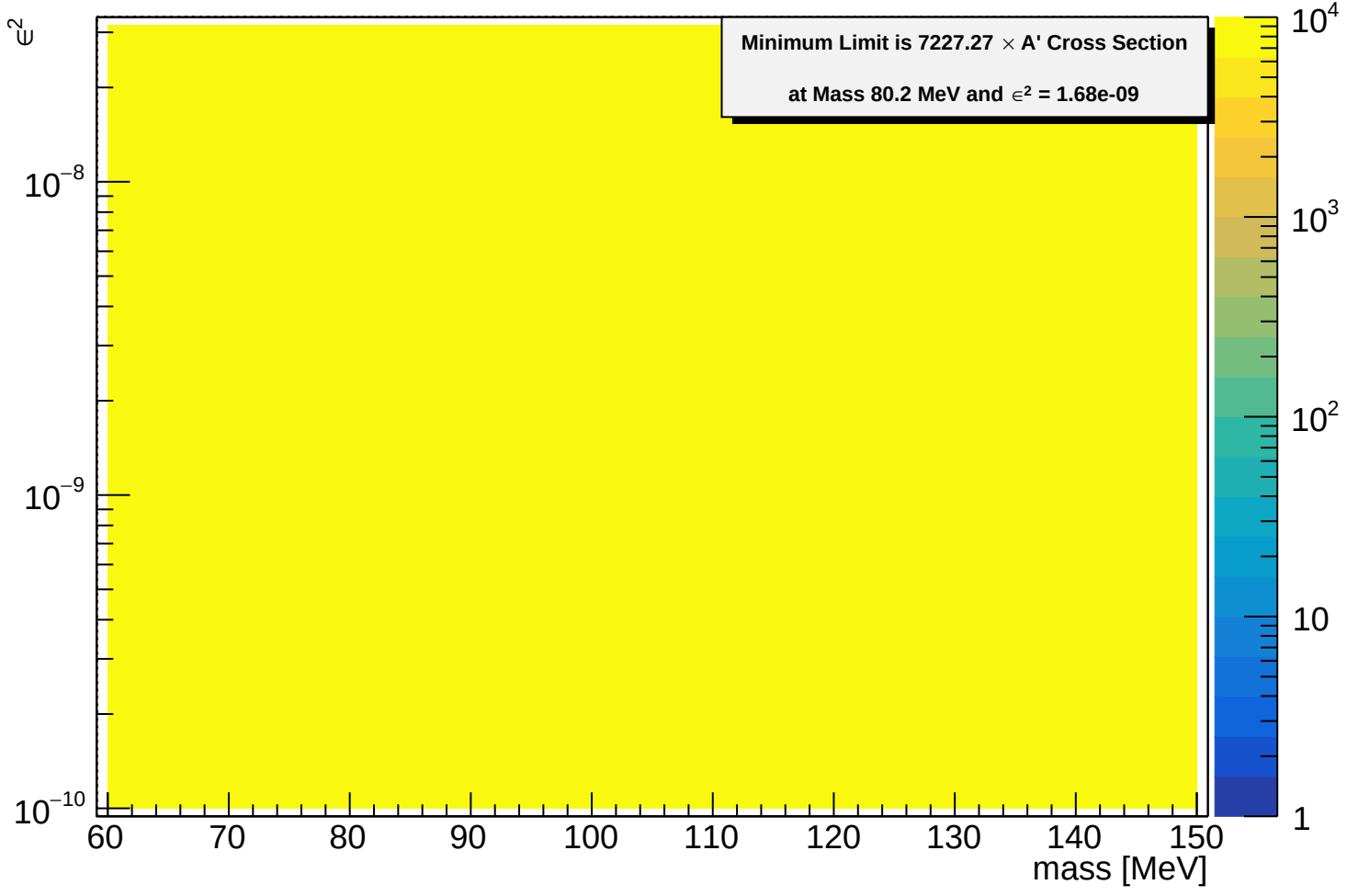

OIM Scaled Limit L1L1 Data 10%
Minimum Limit is 42.69 × A' Cross Section
at Mass 76.5 MeV and ∈² = 2.69e-09
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10⁴
10³
10²
10
1

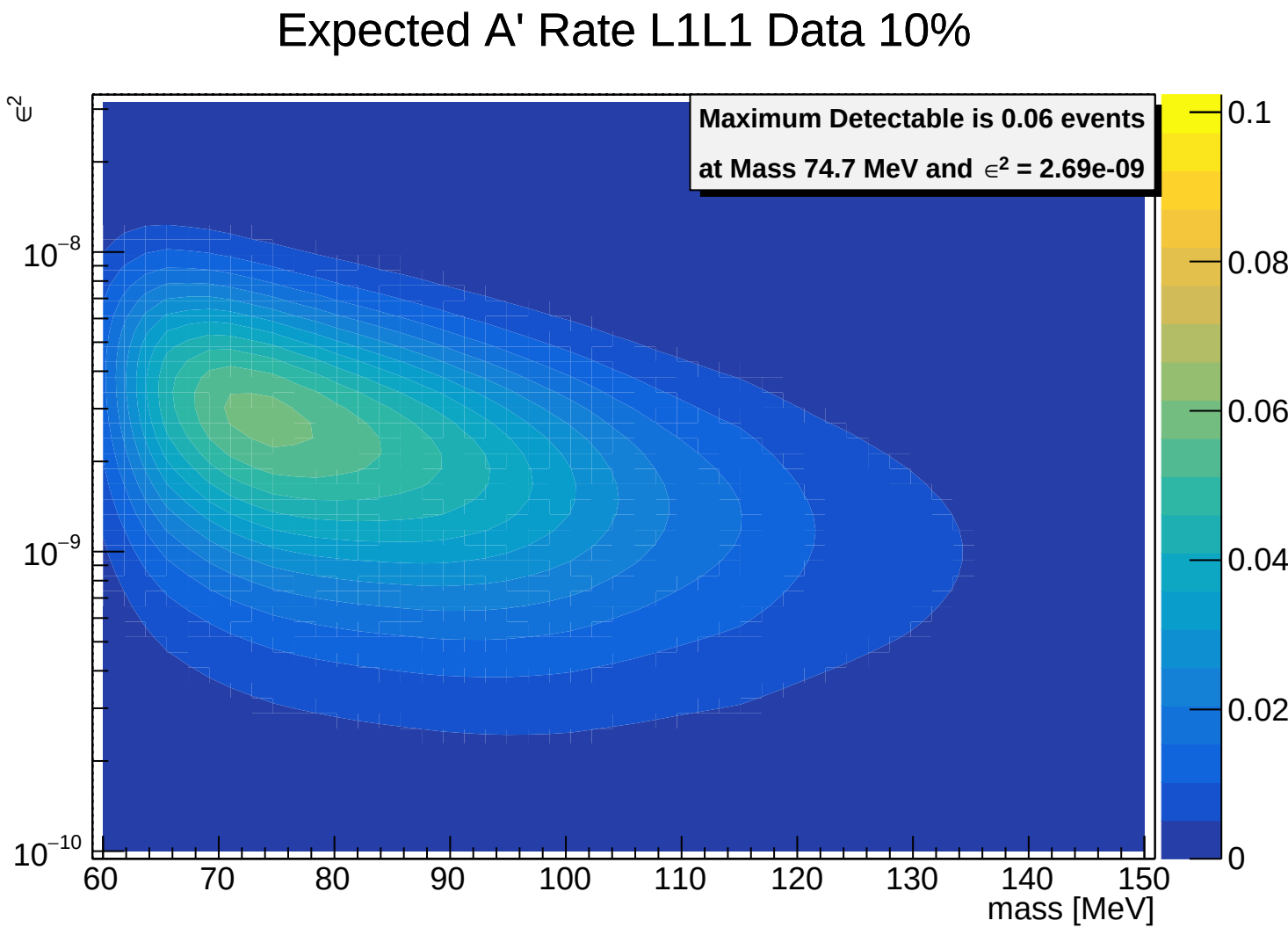
OIM Scaled limit L1L2 Data 10%

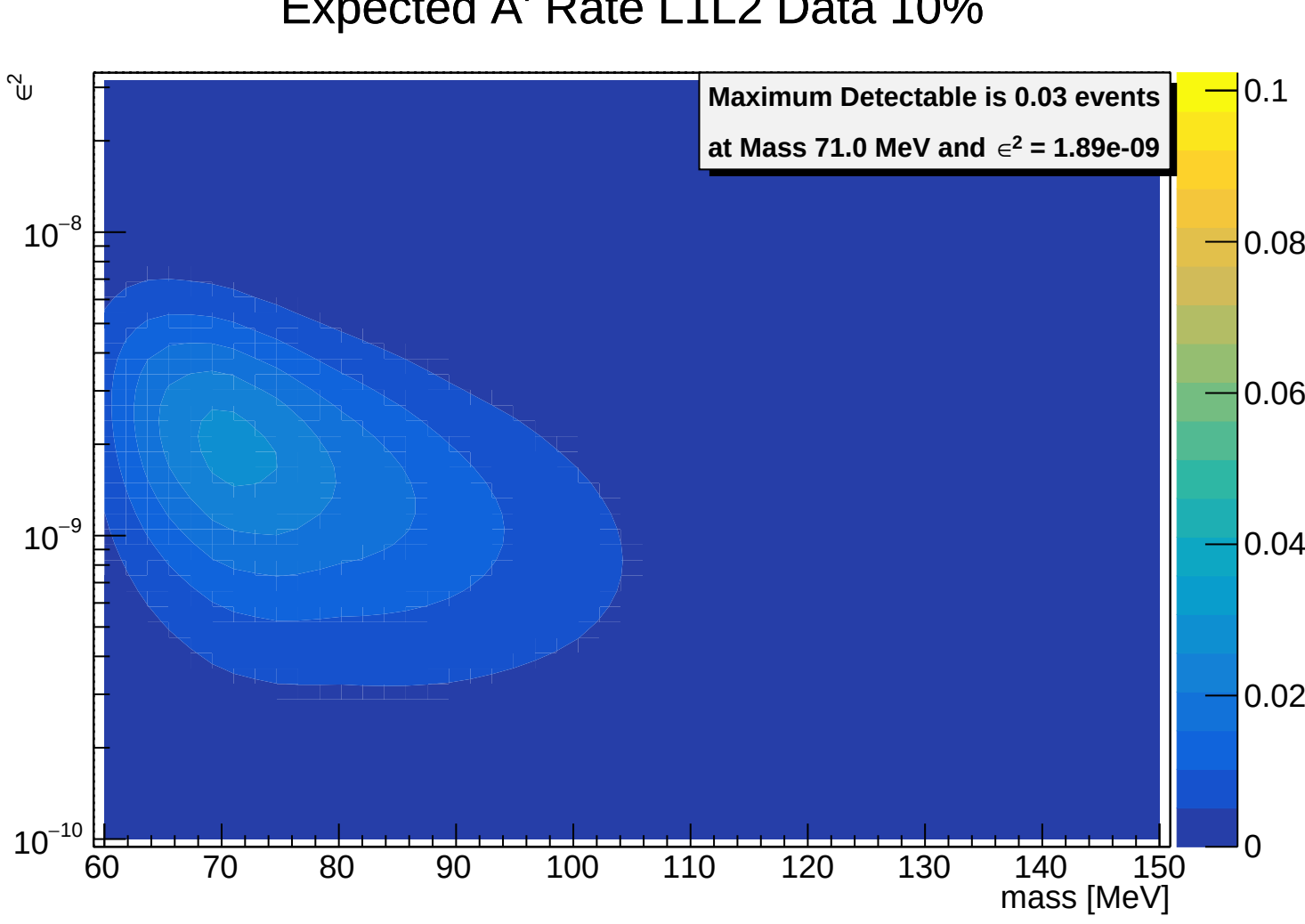



OIM Scaled Limit L2L2 Data 10%
Minimum Limit is 368.45 × A' Cross Section
at Mass 72.9 MeV and ∈² = 1.18e-09
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10⁴
10³
10²
10
1

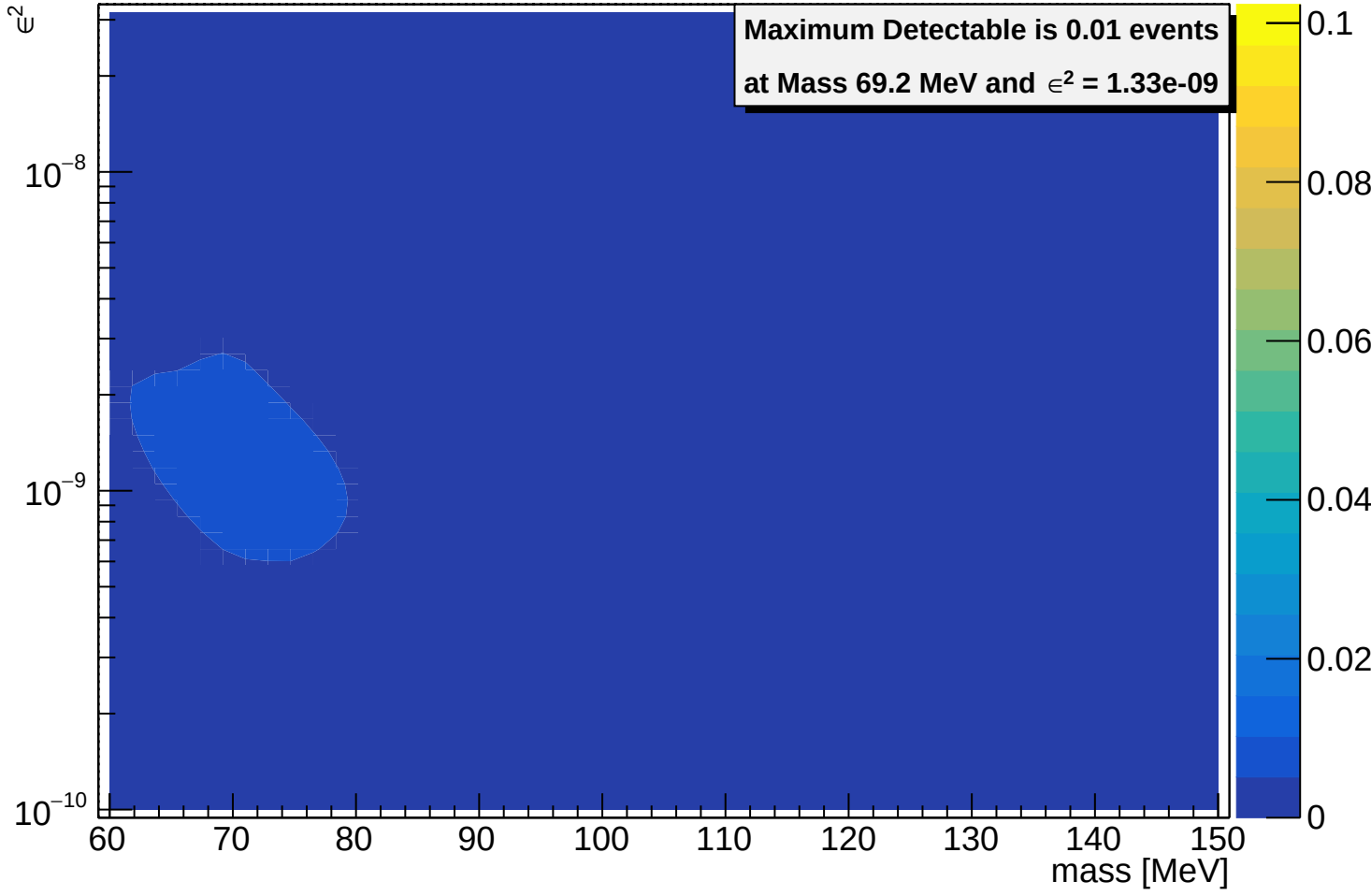
OIM Scaled Limit L1L1 L1L2 Combined



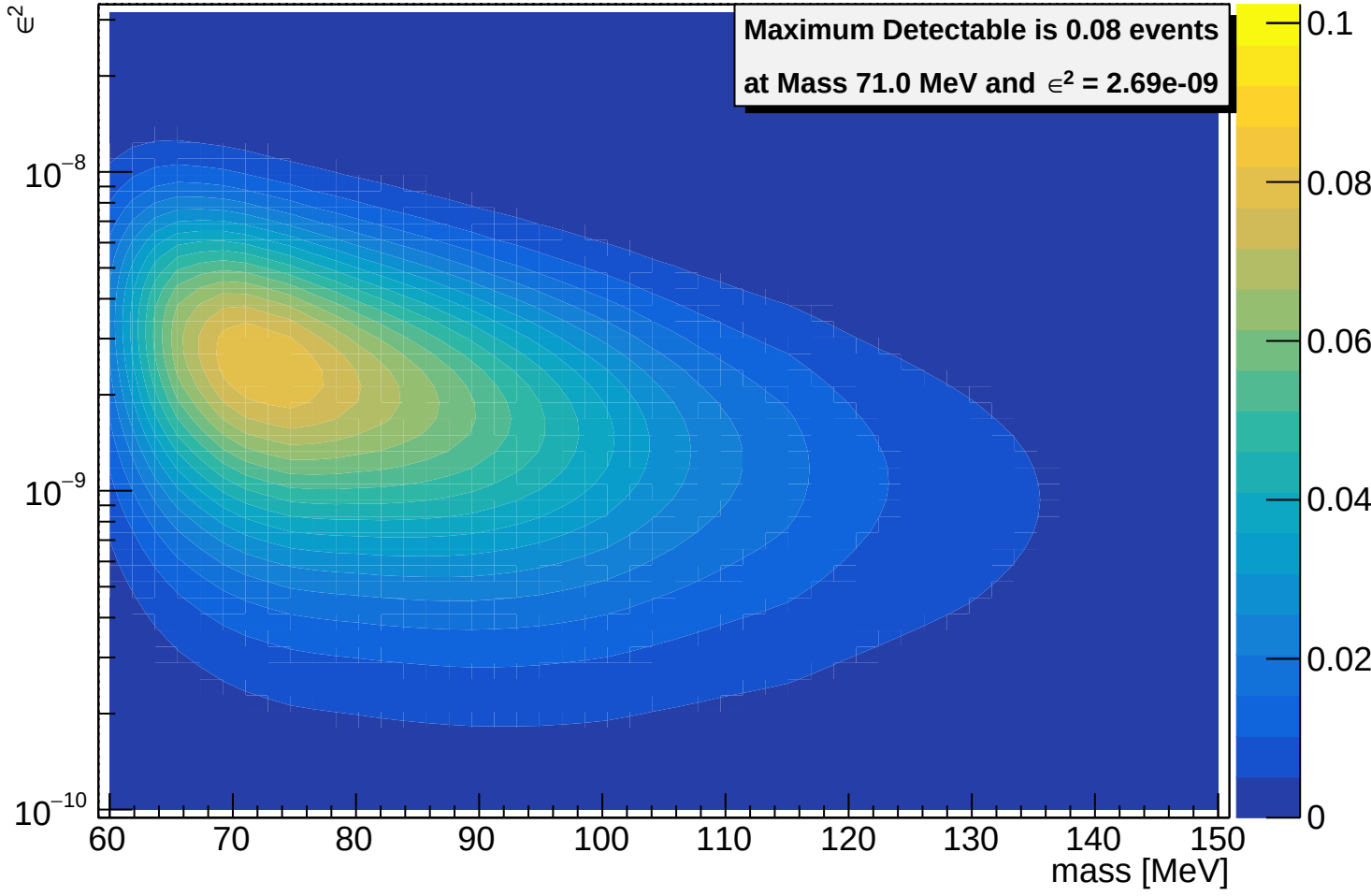

Expected A' Rate L1L1 Data 10%
Maximum Detectable is 0.06 events
at Mass 74.7 MeV and ∈² = 2.69e-09
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
0.1
0.08
0.06
0.04
0.02
0

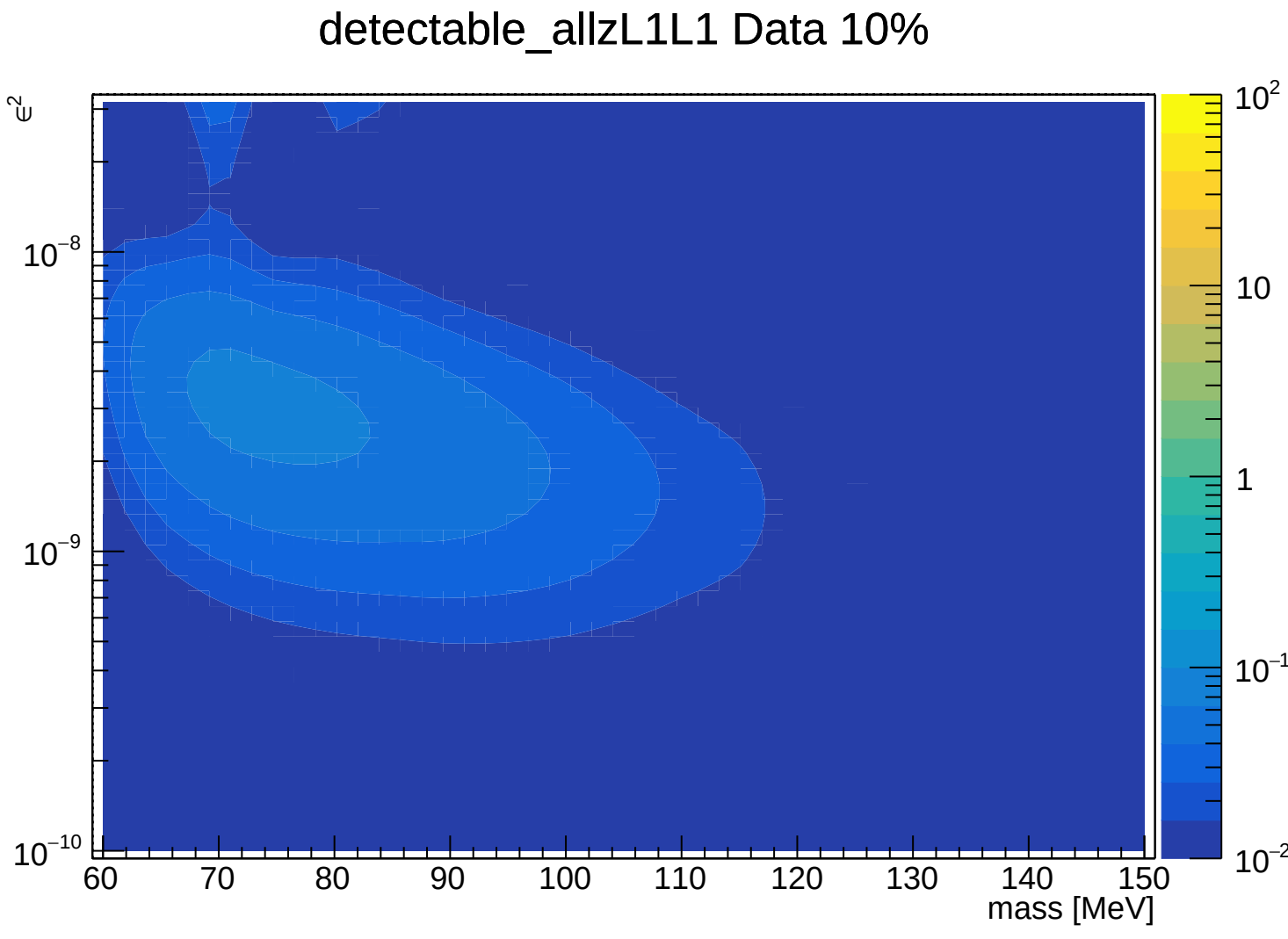

Expected A' Rate L1L2 Data 10%
Maximum Detectable is 0.03 events
at Mass 71.0 MeV and ∈² = 1.89e-09
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
0.1
0.08
0.06
0.04
0.02
0

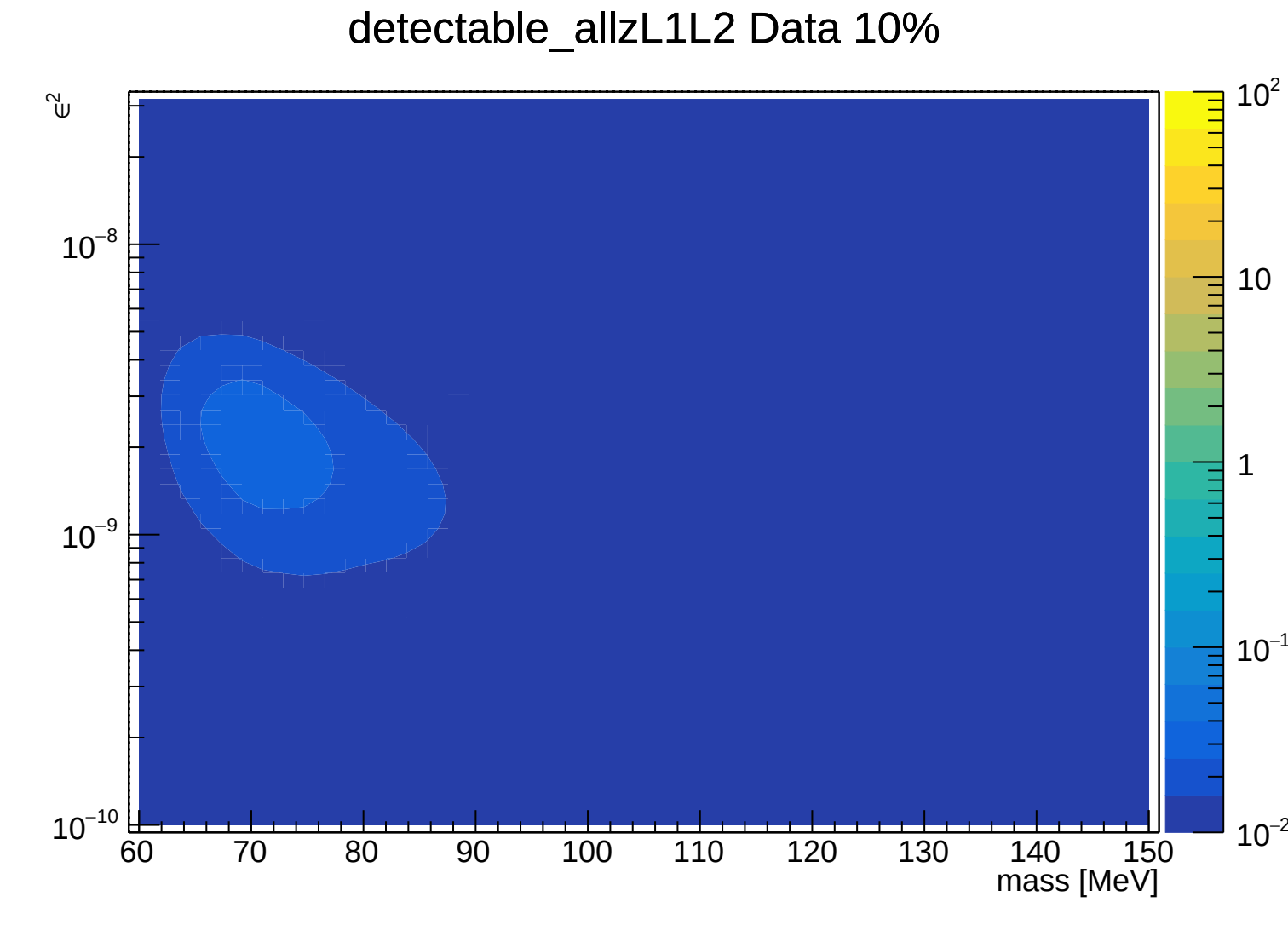
Expected A' Rate L2L2 Data 10%

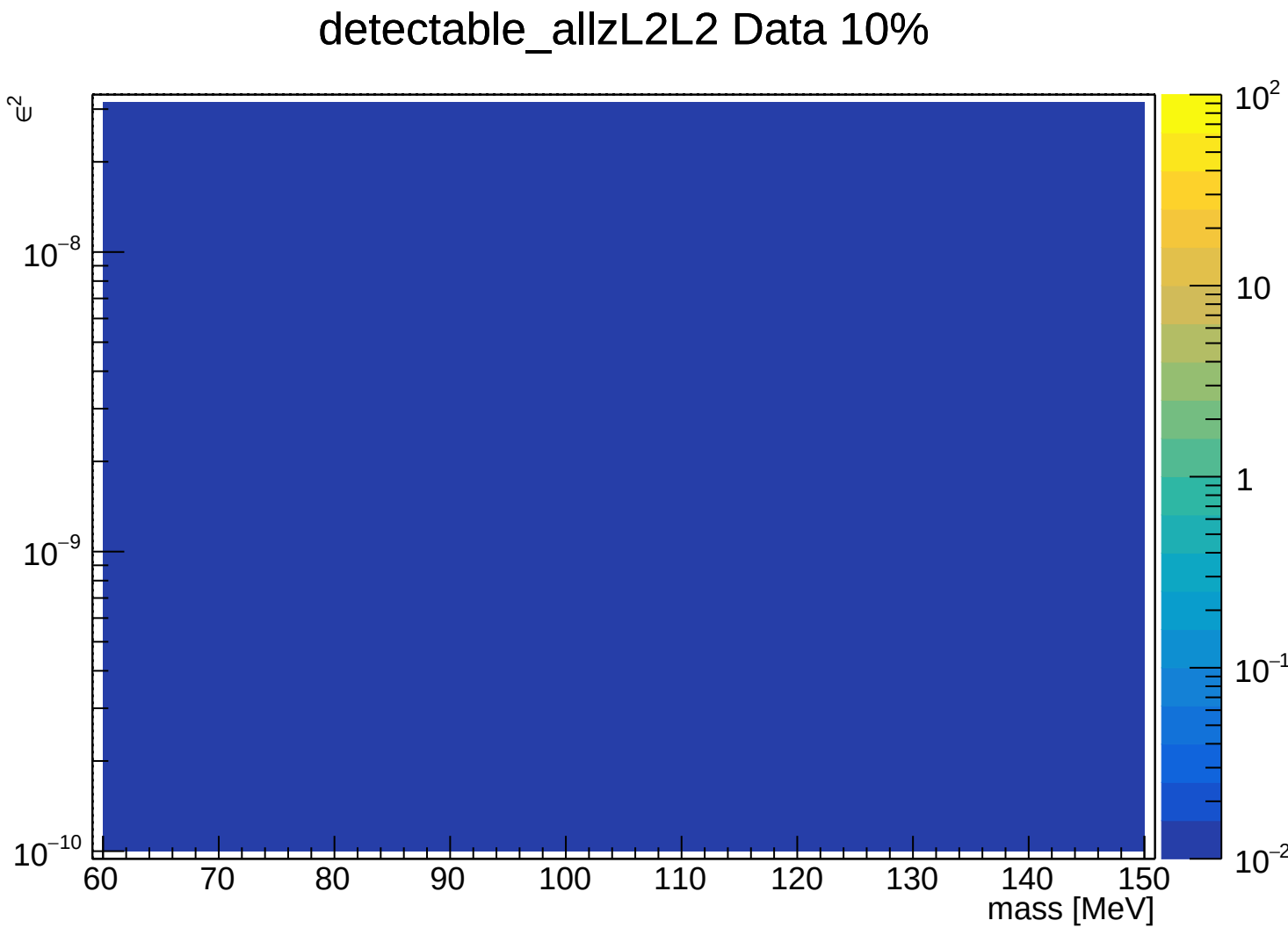


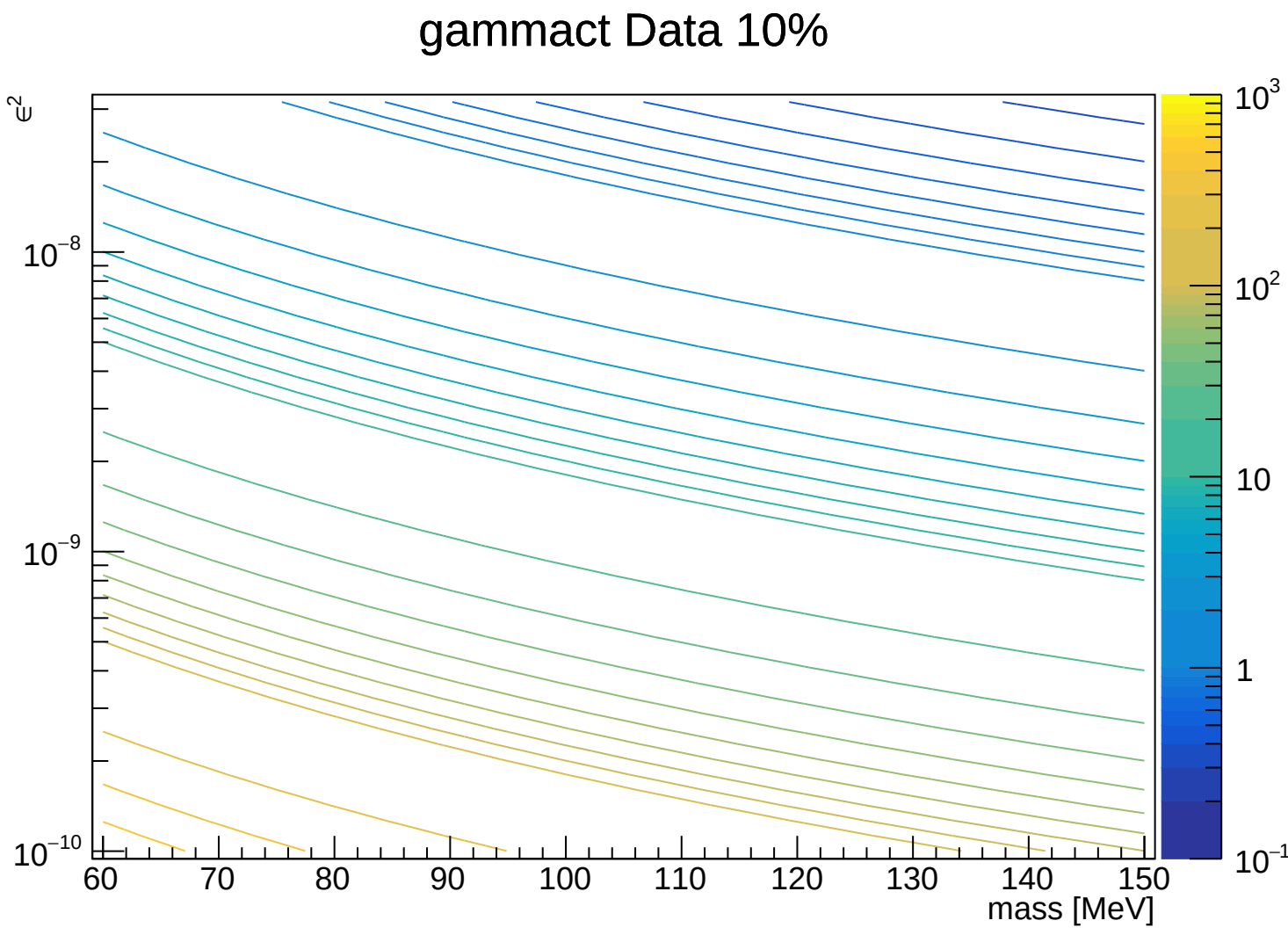
Expected A' Rate L1L1 + L1L2

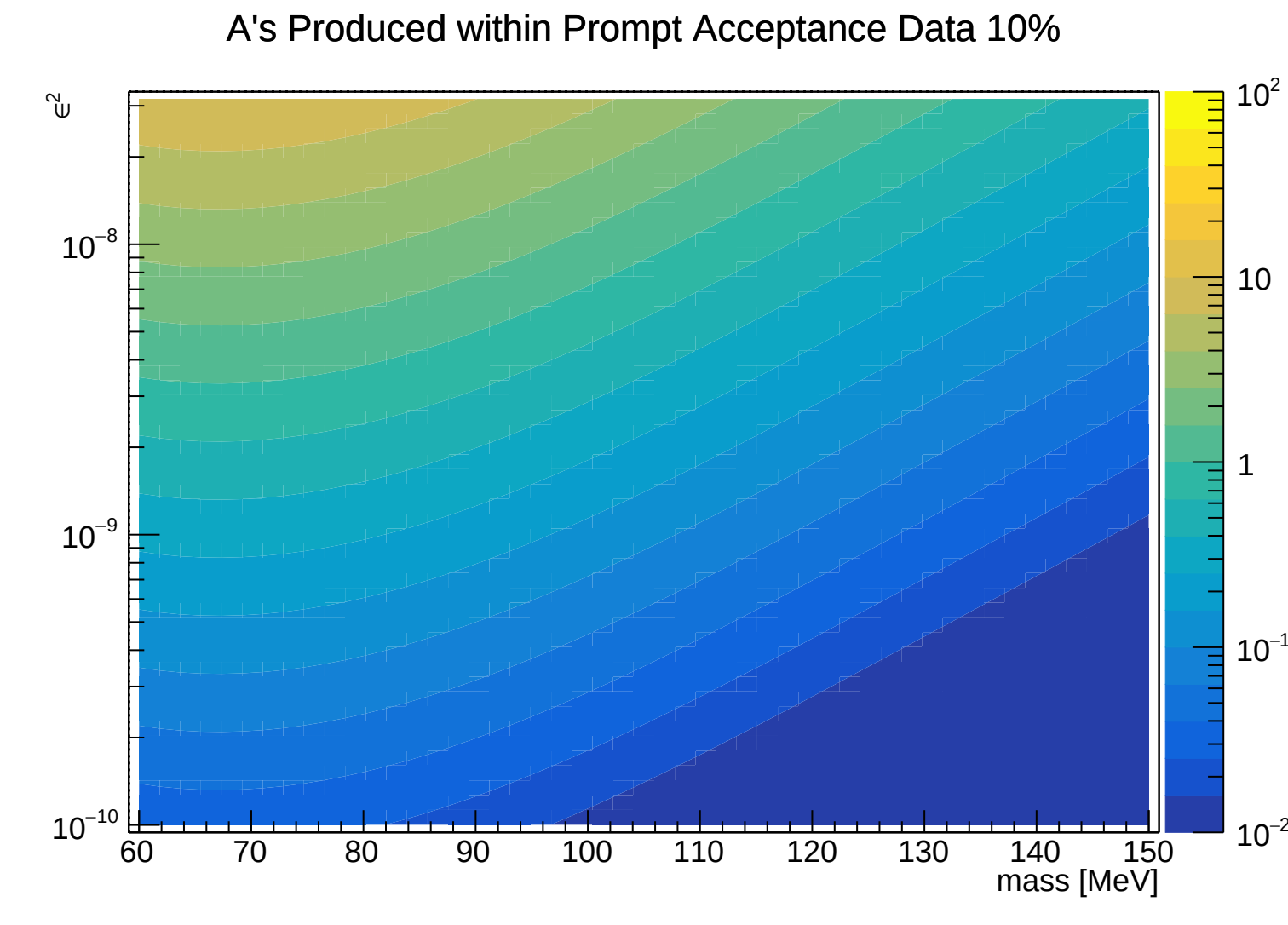



detectable_allzL1L1 Data 10%
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10²
10
1
10⁻¹
10⁻²


detectable_allzL1L2 Data 10%
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10²
10
1
10⁻¹
10⁻²


detectable_allzL2L2 Data 10%
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10²
10
1
10⁻¹
10⁻²


gammact Data 10%
ϵ^2
10^{-8}
10^{-9}
10^{-10}
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10^3
10^2
10
1
10^{-1}


A's Produced within Prompt Acceptance Data 10%
ε²
10⁻⁸
10⁻⁹
10⁻¹⁰
60
70
80
90
100
110
120
130
140
150
mass [MeV]
10²
10
1
10⁻¹
10⁻²