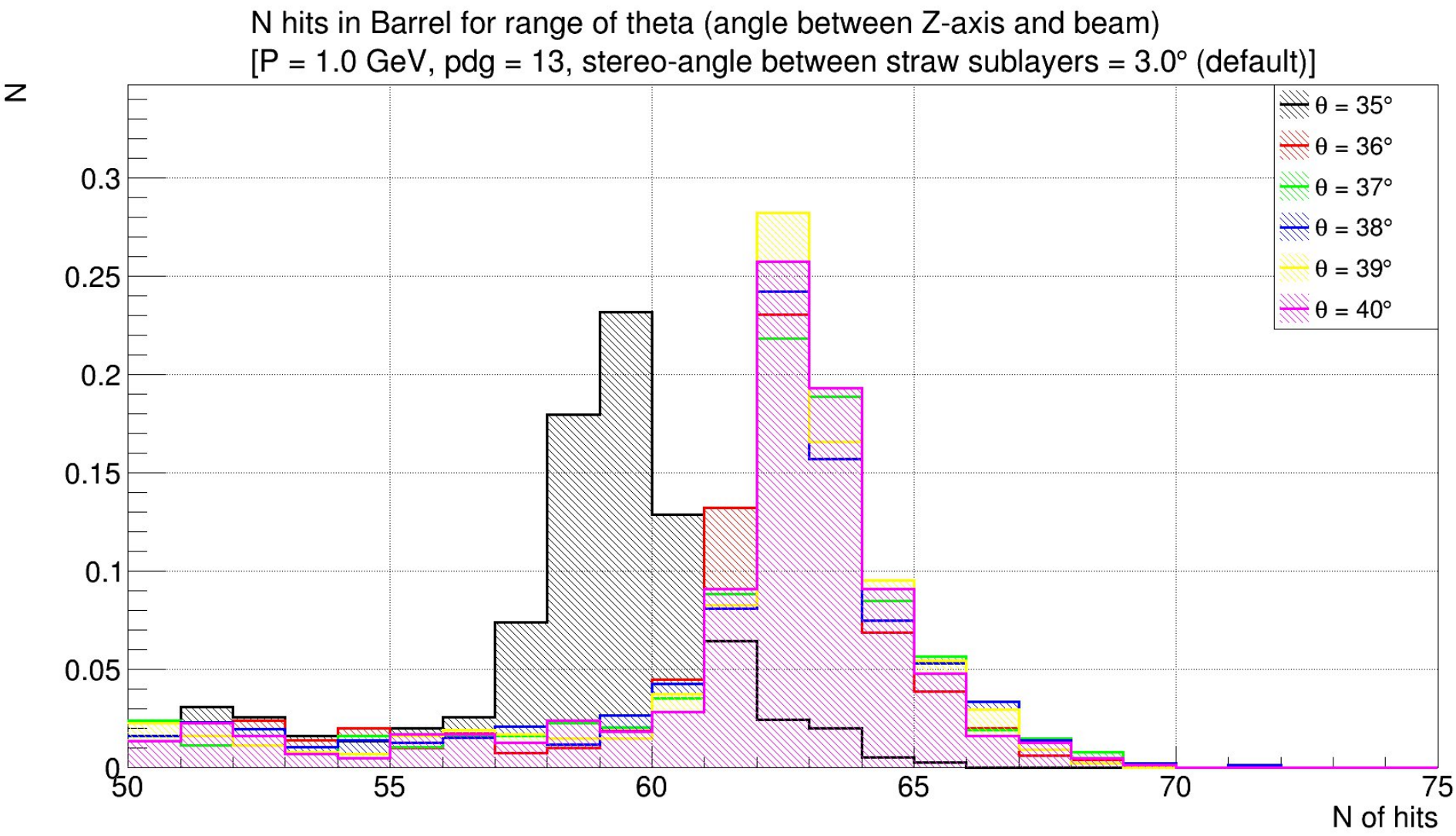
# Simulation straw detector with parameterization at reconstruction

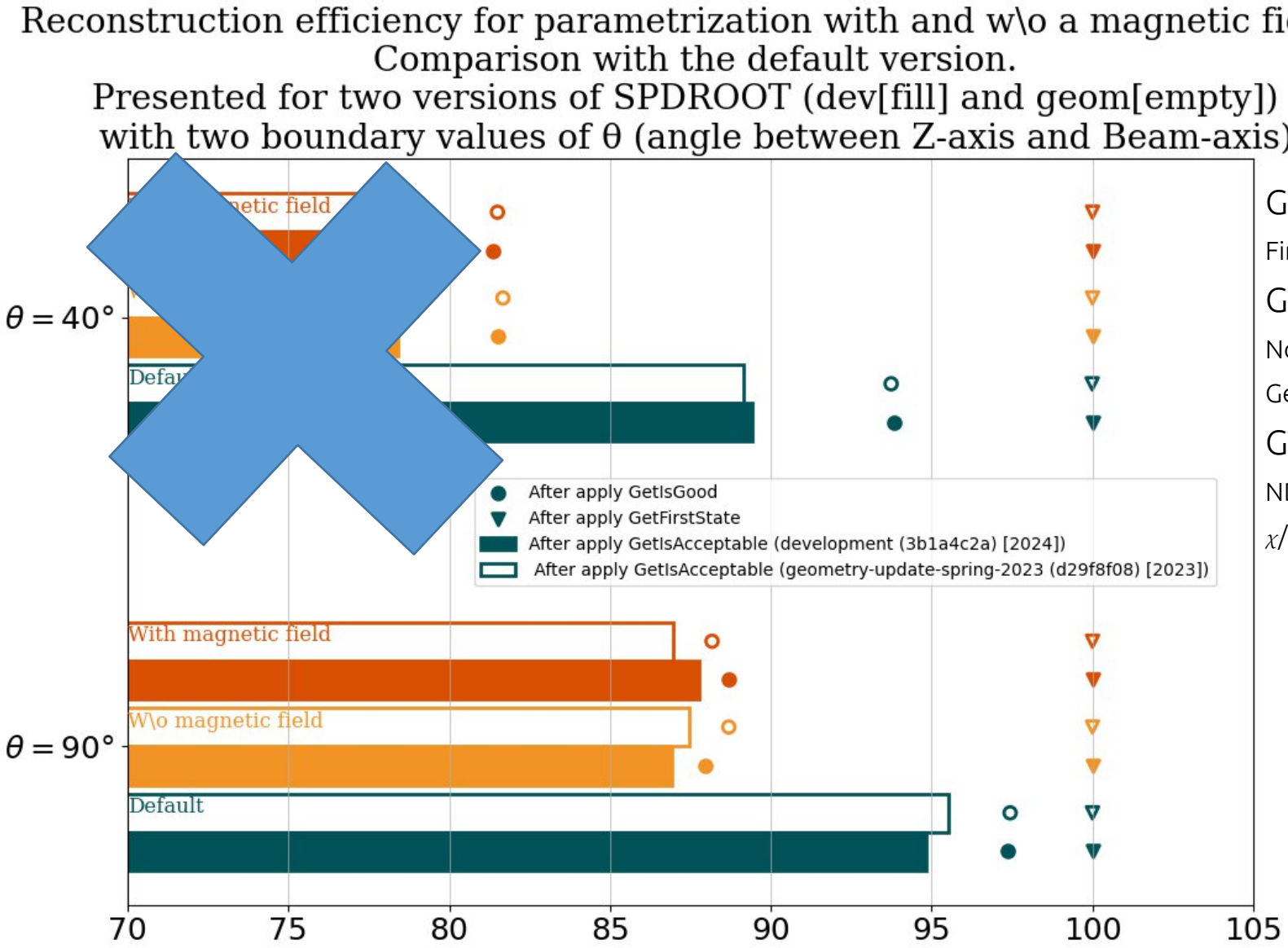
2024-04-30

Ekaterina Mosolova

# Boundary angle between Z-axis and Beam-axis is 36°



# Parameterization reduces the efficiency of track reconstruction




GetFirstState()

First track point fit data

GetIsGood()

No error message

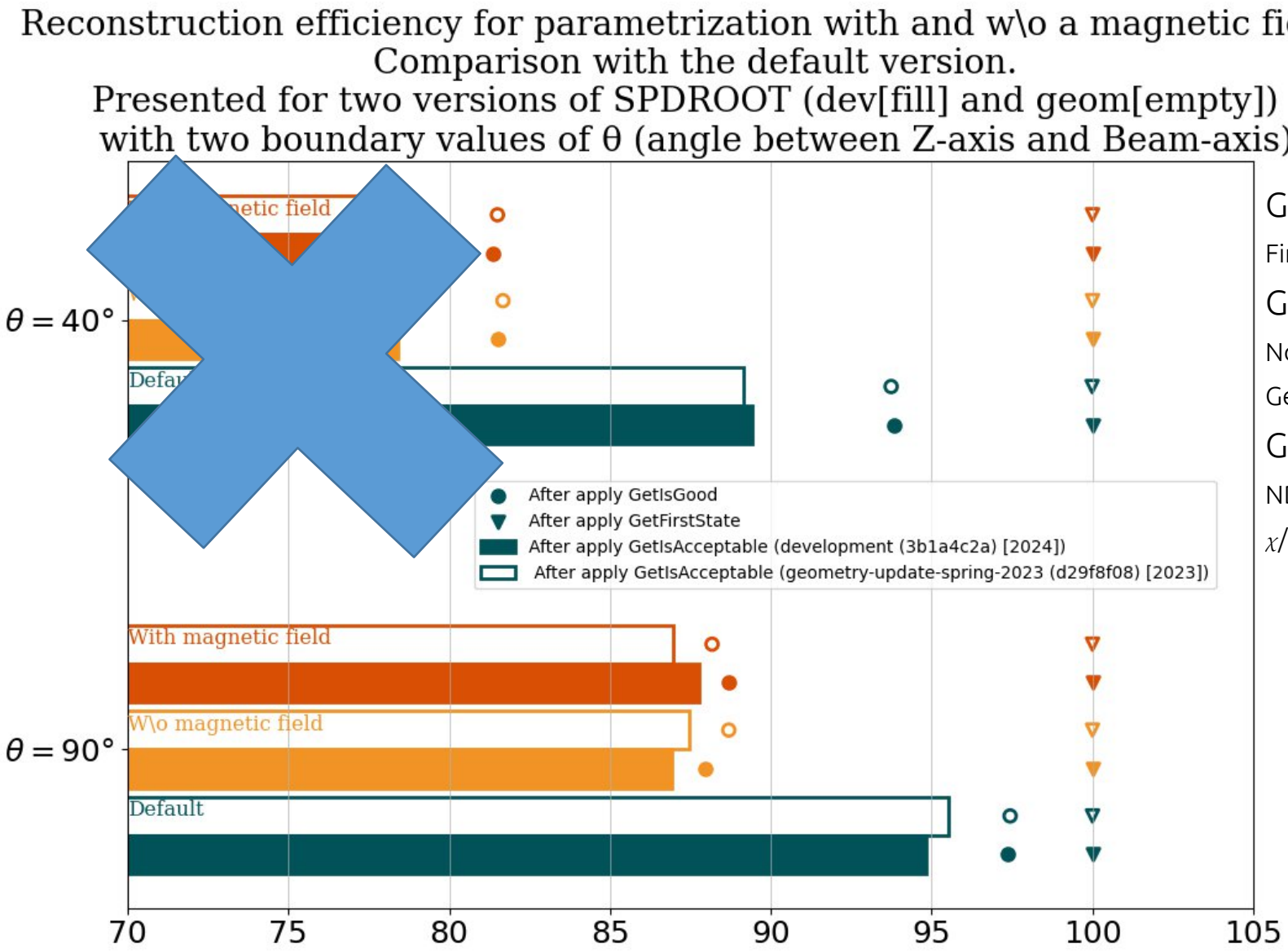
GenFit fully converged

GetIsAcceptable()

NDF > 3

$\chi$/NDF < 2

# The difference between parameterization with and w\o magnetic field is within 2%




GetFirstState()

First track point fit data

GetIsGood()

No error message

GenFit fully converged

GetIsAcceptable()

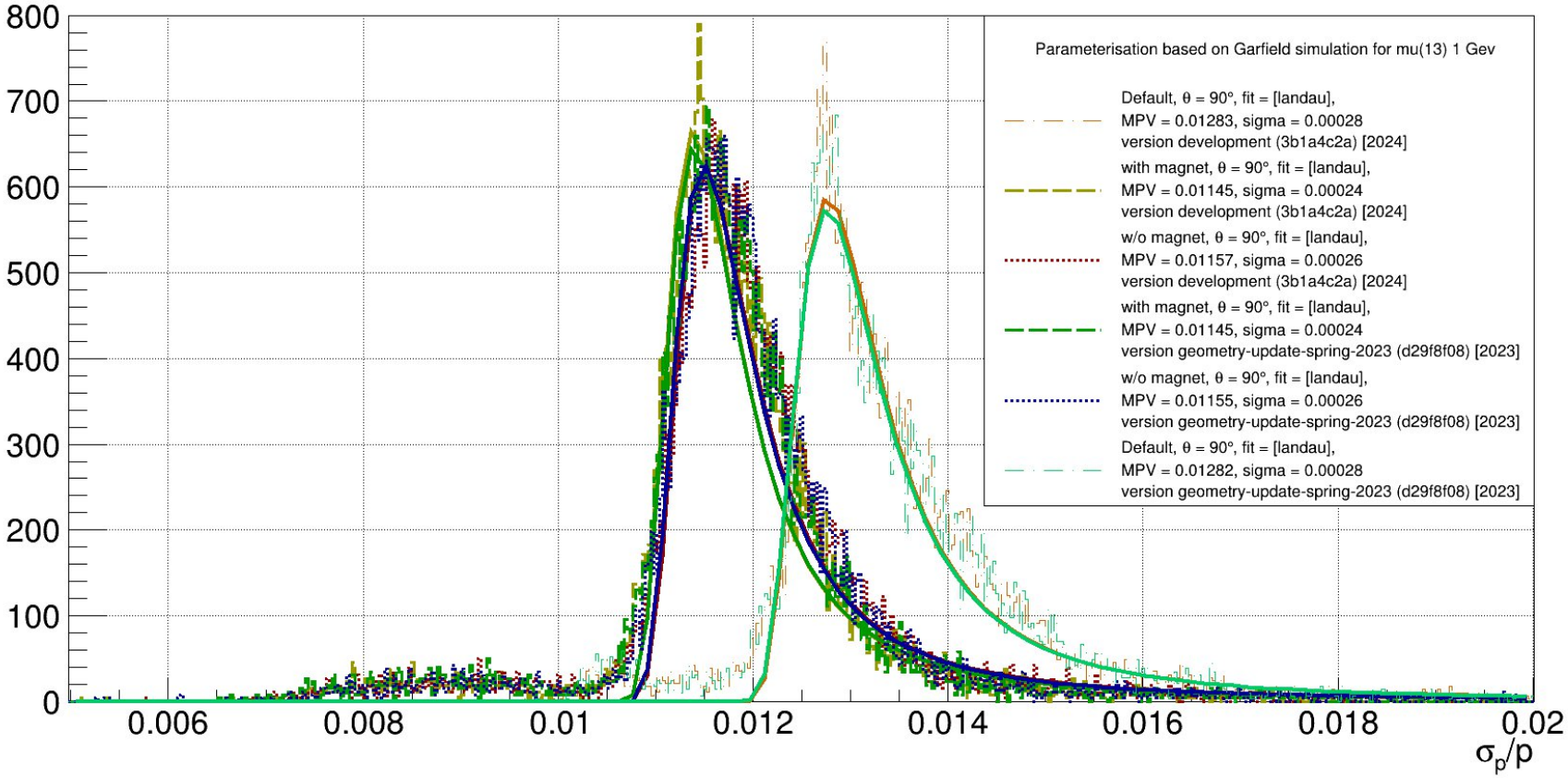
NDF > 3

$\chi$/NDF < 2

Momentum resolution (full) is better with parameterization.
The difference is more than 10%

The difference between parameterization with and without a magnetic field is less than 1 %

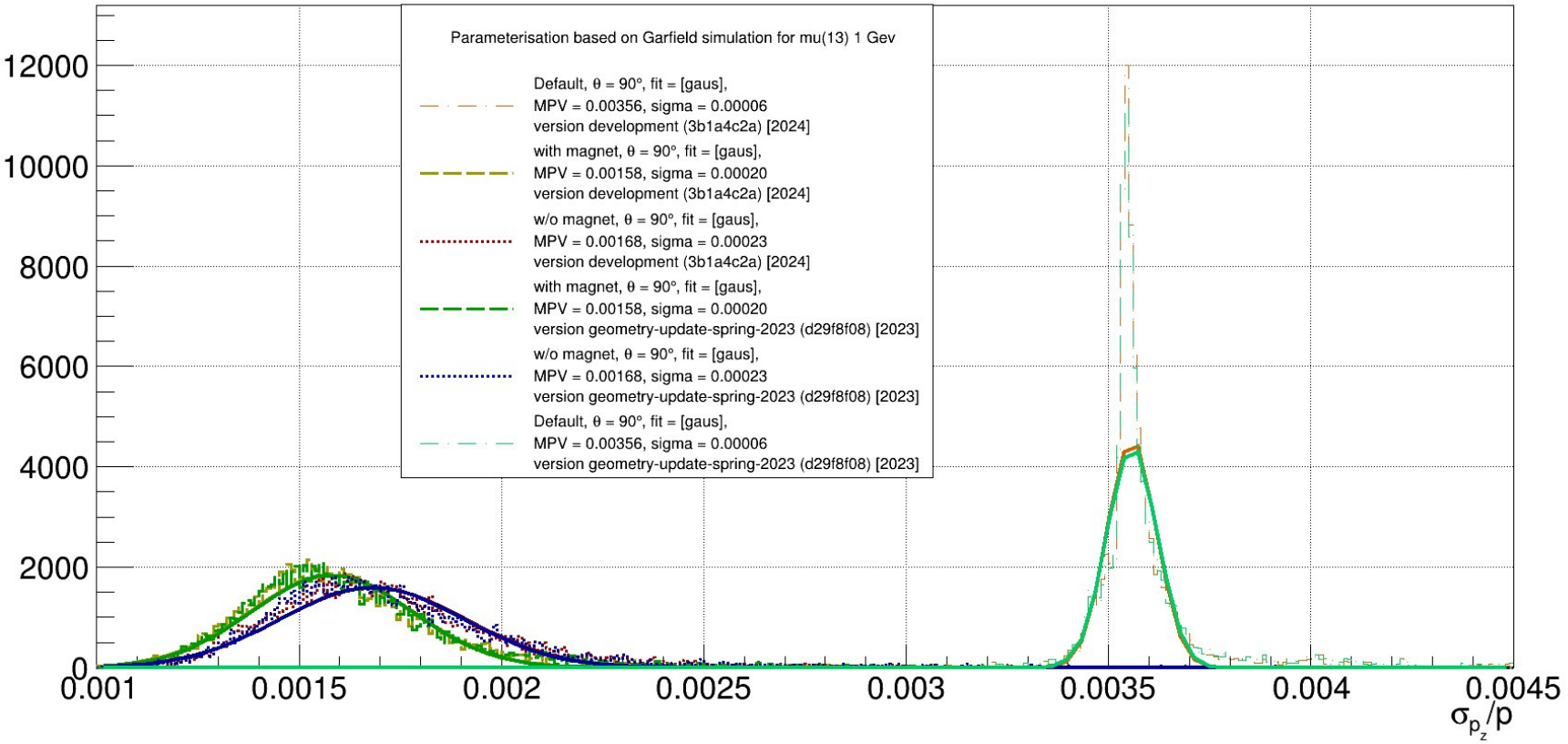
$\sigma_p/p$ for $\theta$=90° (angle between Z-axis and beam)
[P = 1.0 GeV, pdg = 13, stereo-angle between straw sublayers = 3.0° (default)]



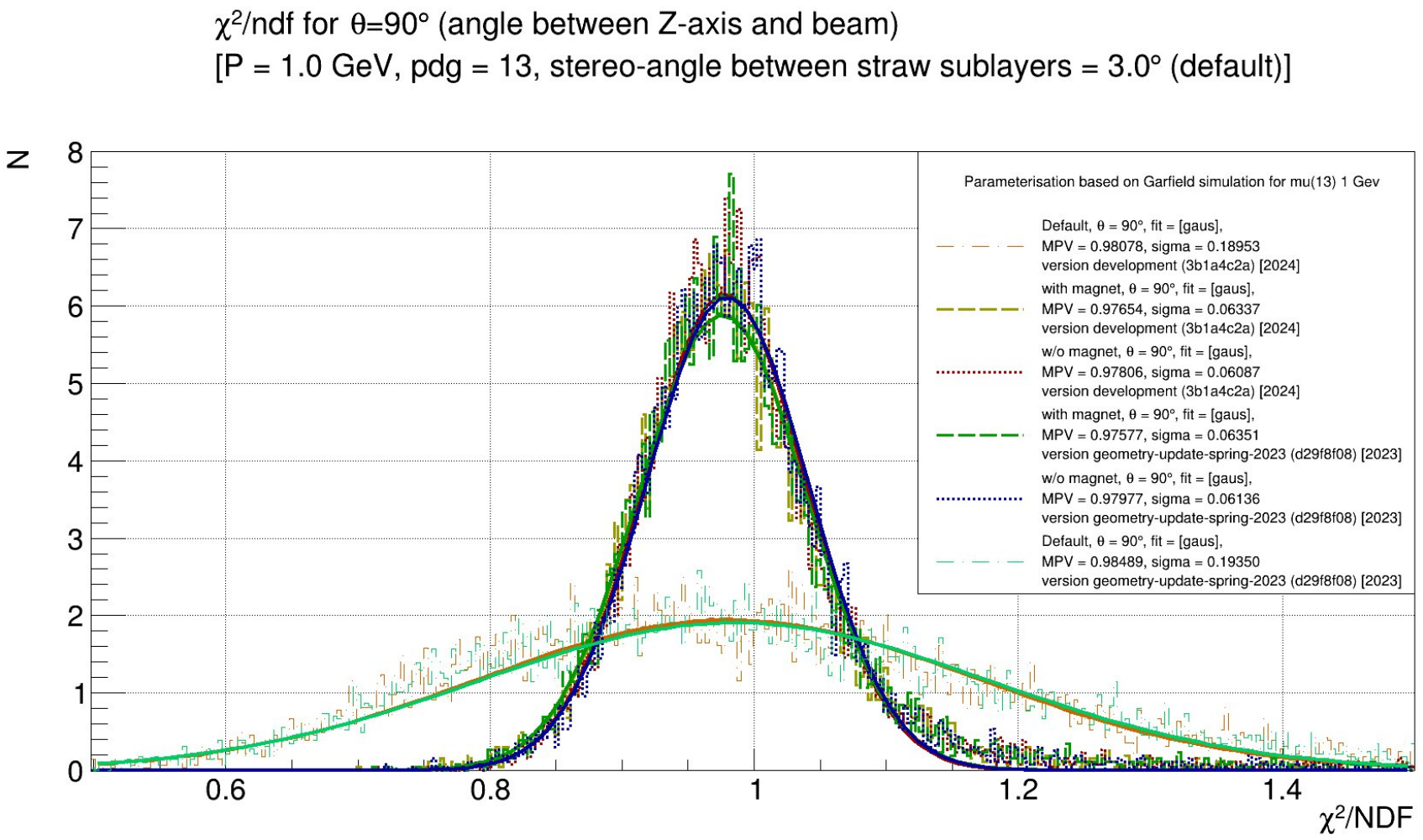
Momentum resolution (Z) is better with parameterization.
The difference is more than 50%

The difference between parameterization with and without a magnetic field is less than 7 %

$\sigma_{p_z}/p_z$ for θ=90° (angle between Z-axis and beam)
[P = 1.0 GeV, pdg = 13, stereo-angle between straw sublayers = 3.0° (default)]

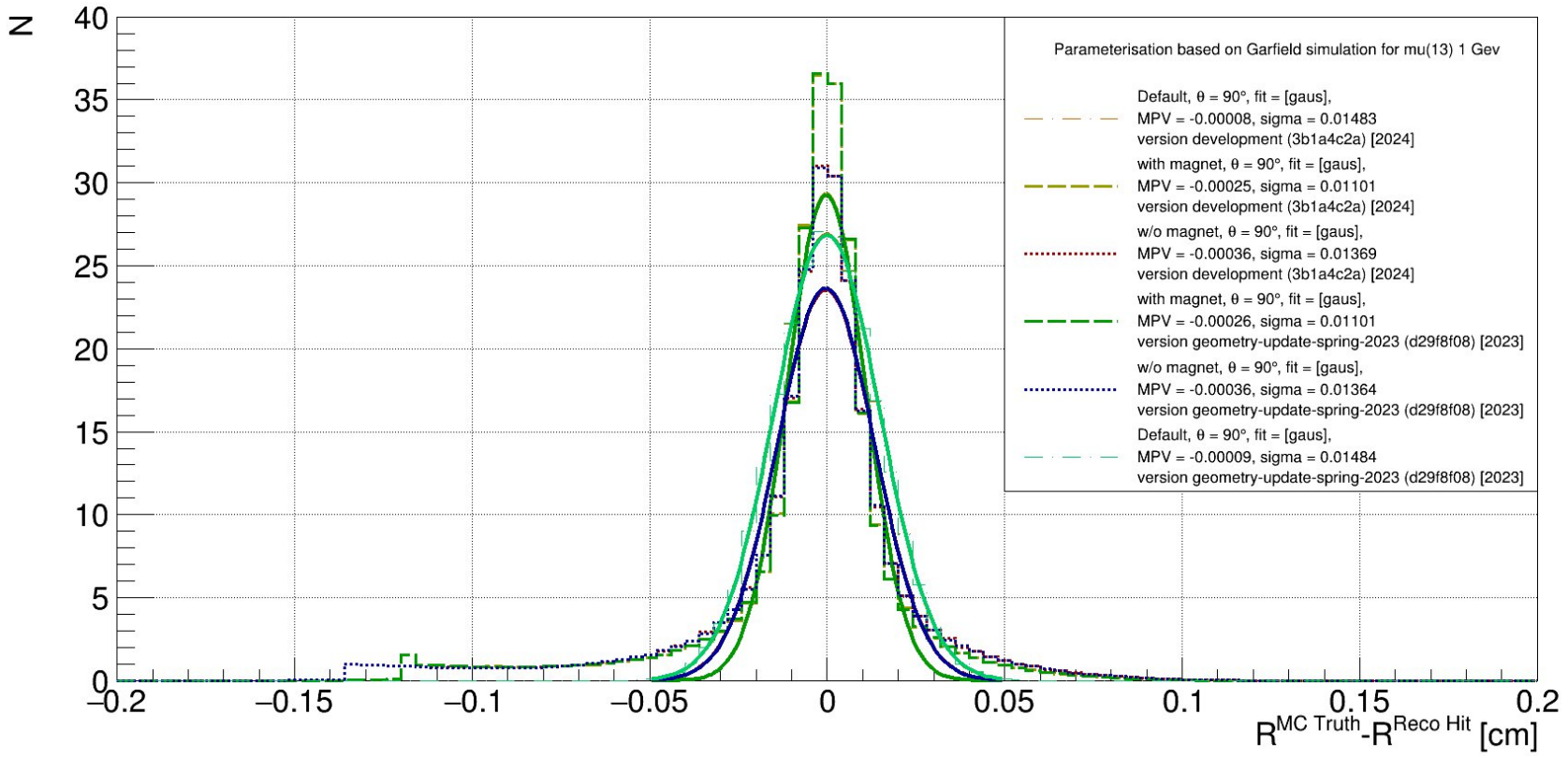


# $\chi^2$/ndf there is no difference

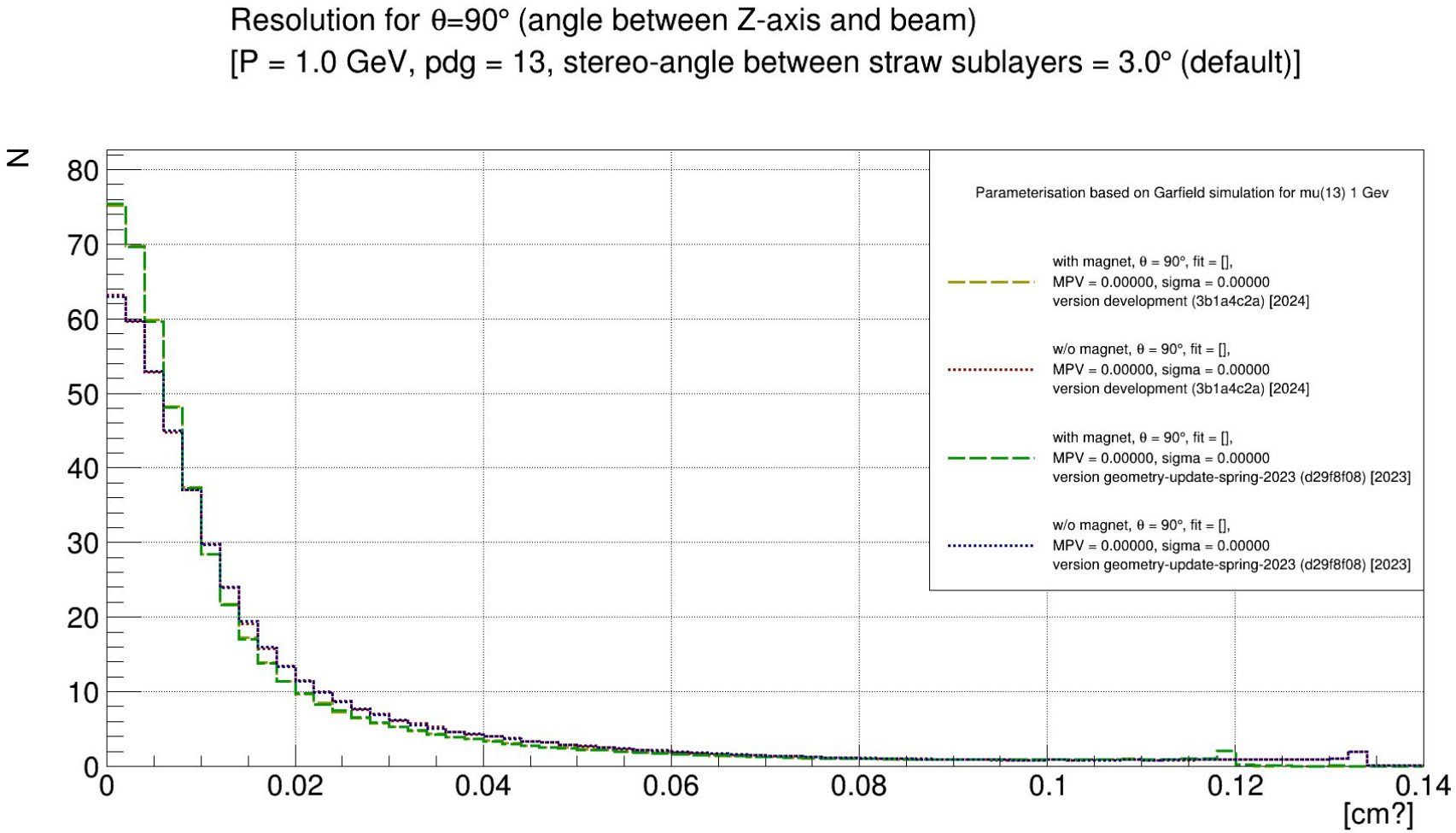
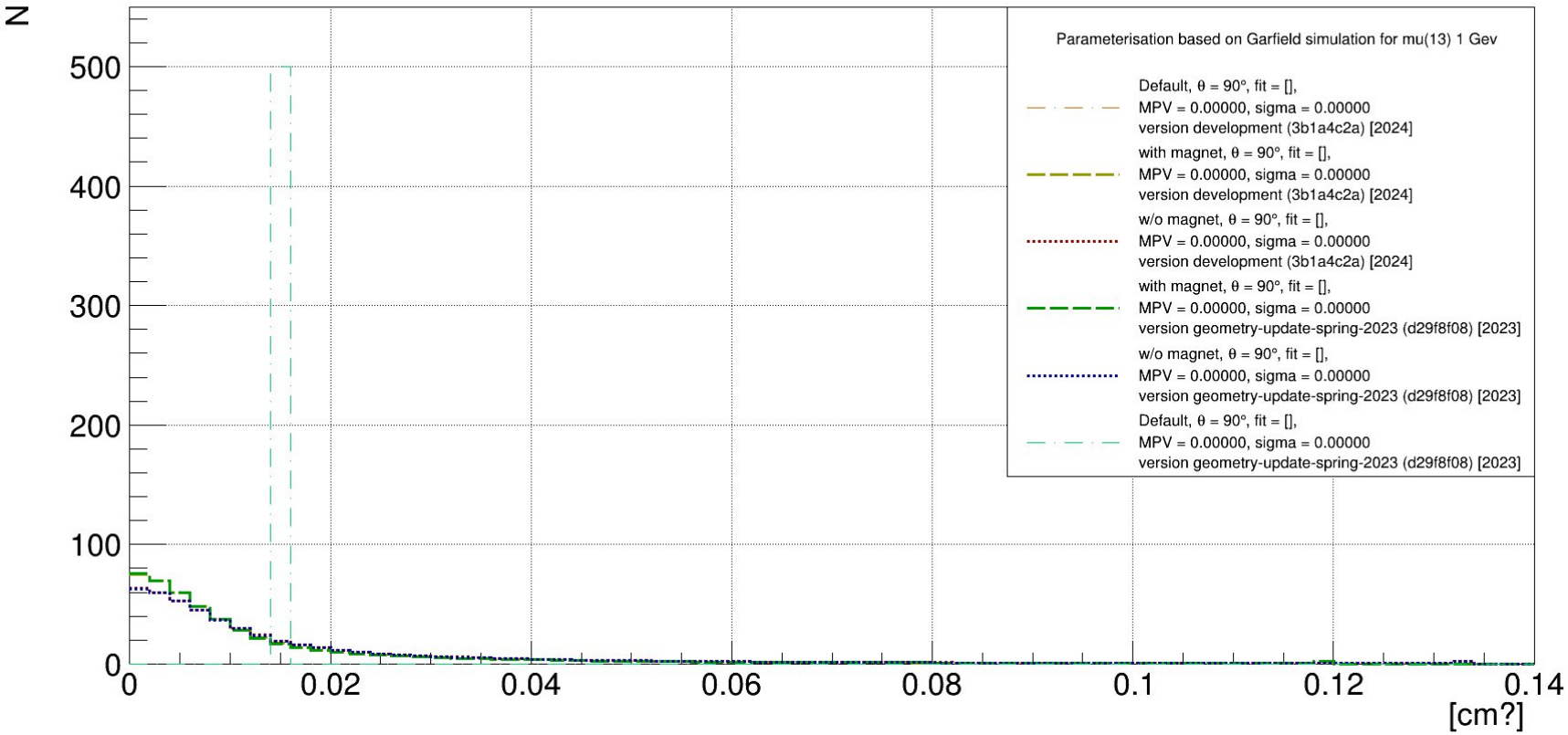


# The residual distribution is wider for the default version

Residual for θ=90° (angle between Z-axis and beam)
[P = 1.0 GeV, pdg = 13, stereo-angle between straw sublayers = 3.0° (default)]



# Resolution distribution when comparing parameterization with and without a magnetic field. Parameterization without magnetic field gives a wider distribution



Resolution for θ=90° (angle between Z-axis and beam)
[P = 1.0 GeV, pdg = 13, stereo-angle between straw sublayers = 3.0° (default)]