Sensitivity for various possible δ_{yt} for the case of E_{CM}= 14TeV and luminosity = $10ab^{-1}$. A 50GeV binning was done and the last bin had events between 10 and 20. The dotted line shows 2σ line and the right plot zooms in to illustrate the 2σ cutting point for the given luminosity and c.m. energy.

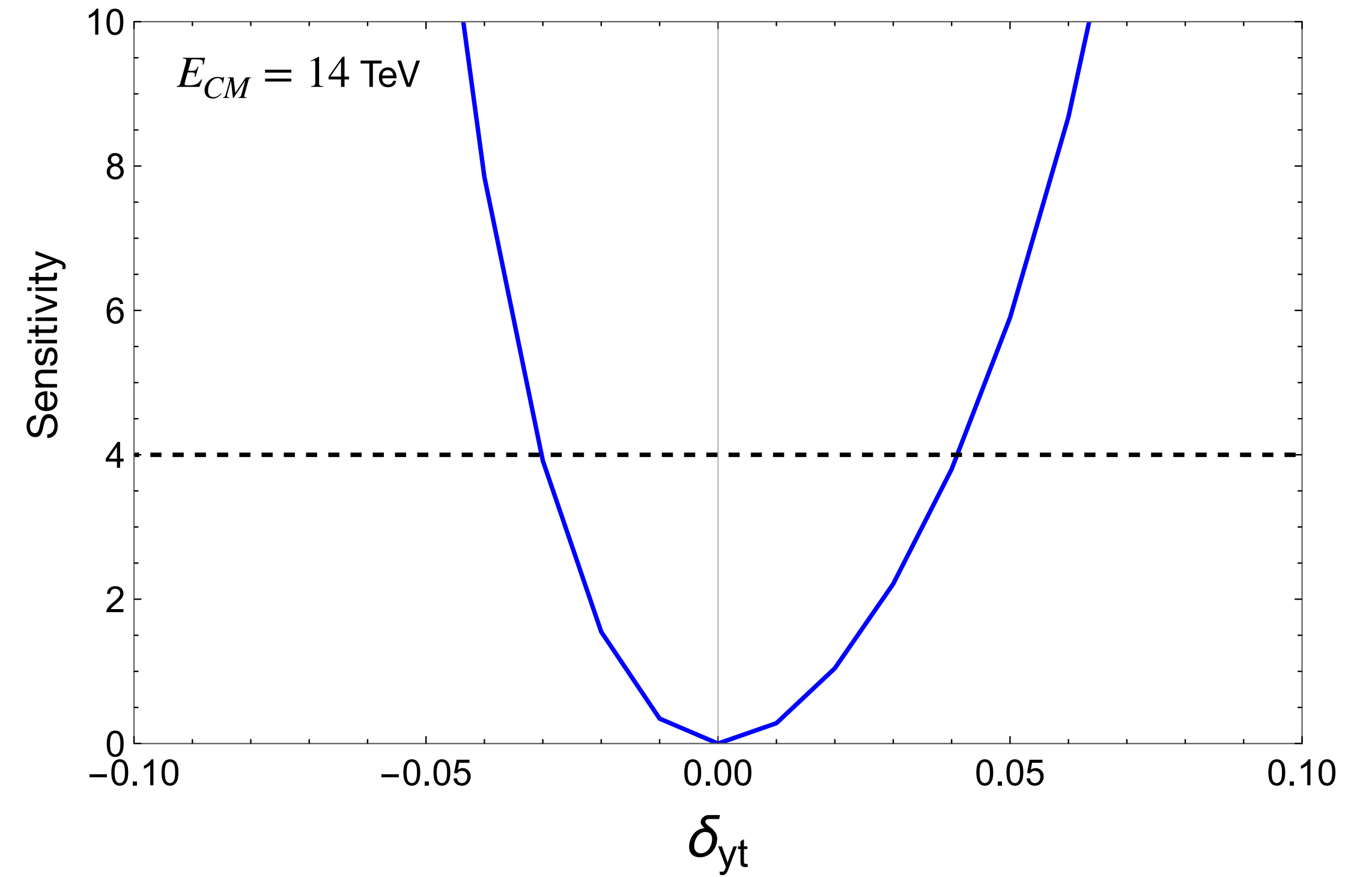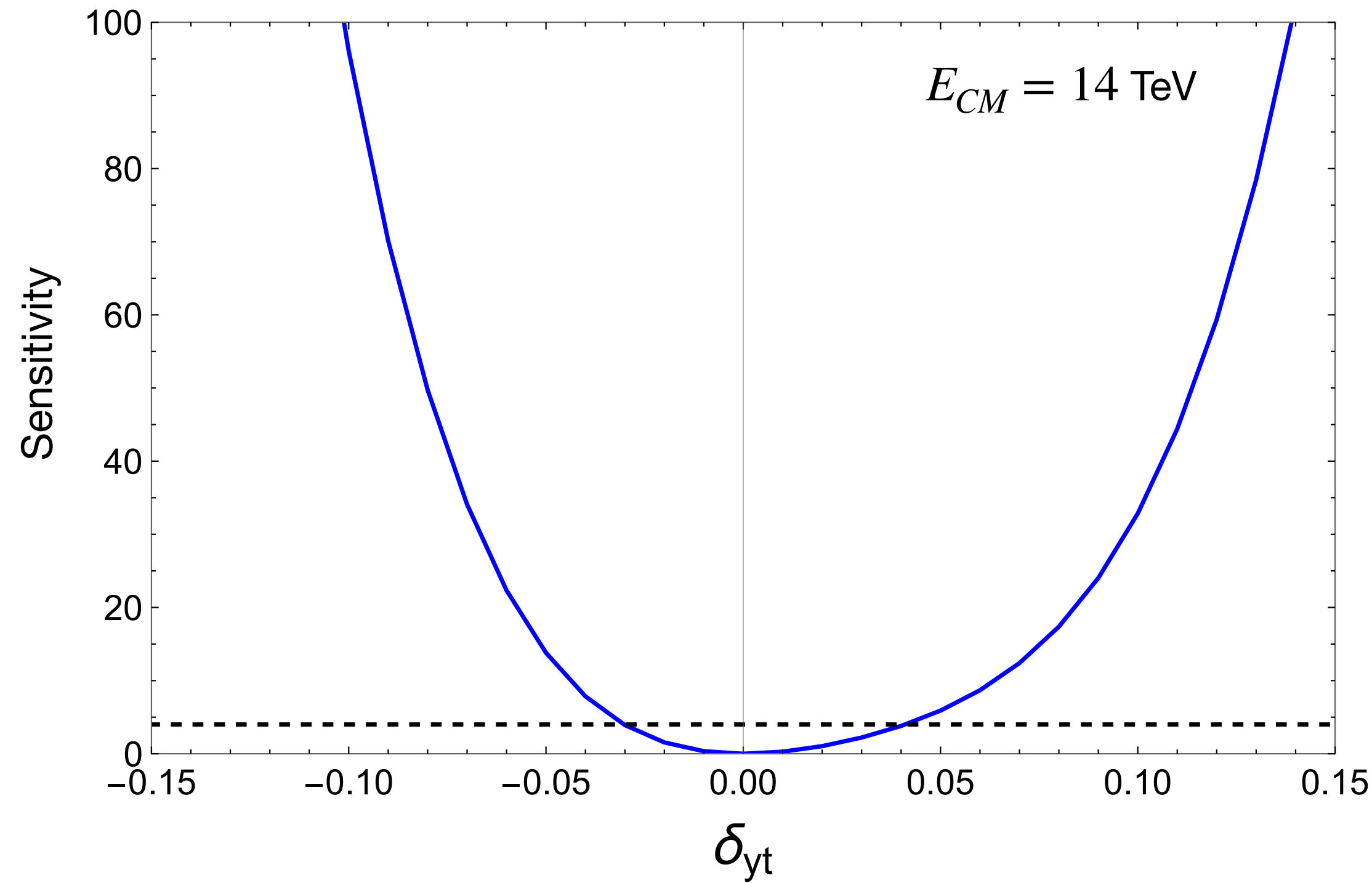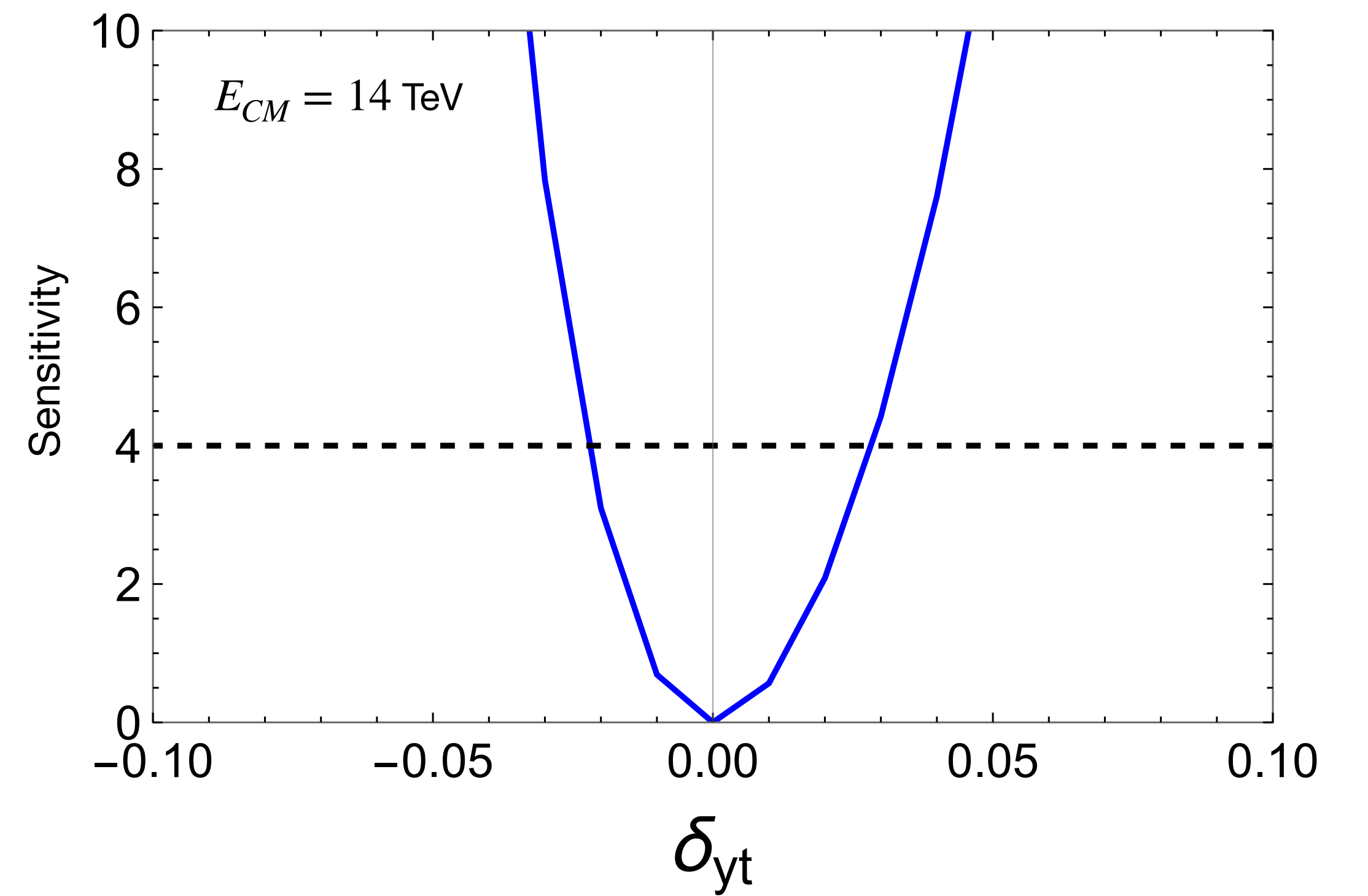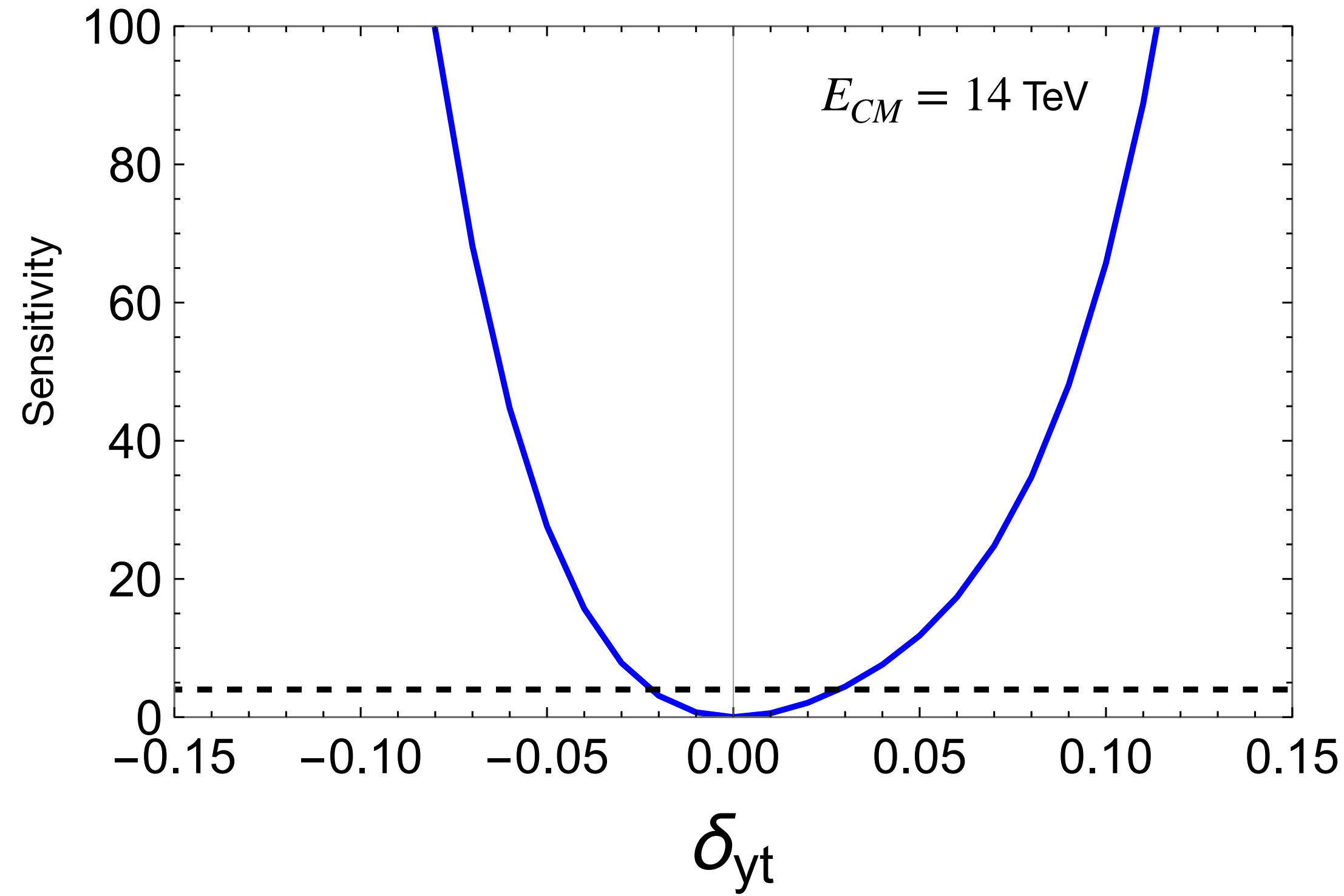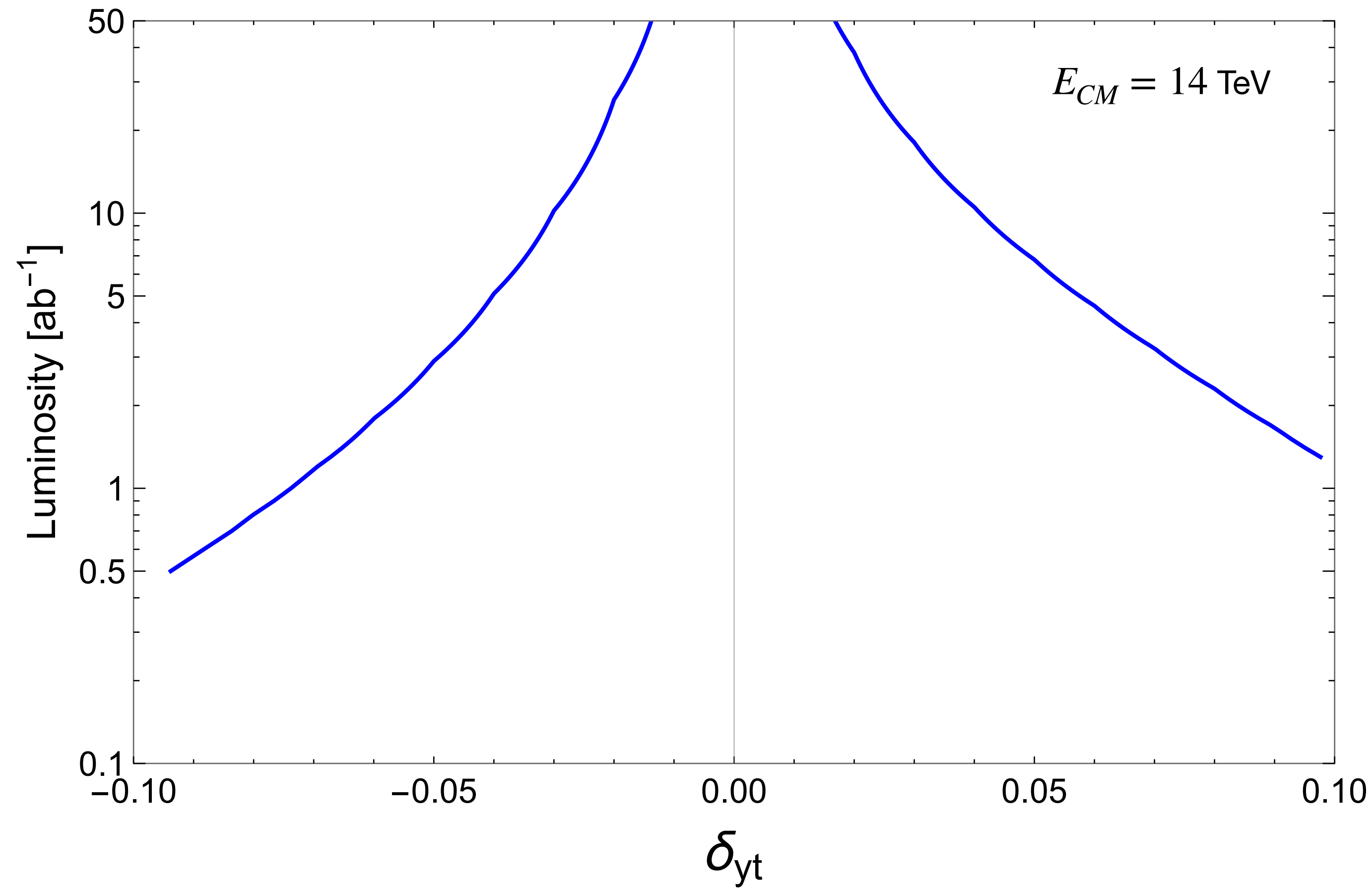# Sensitivity for Luminosity = $20 ab^{-1}$ and E_{CM} = 14TeV

Sensitivity for various possible δ_{yt} for the case of E_{CM}= 14TeV and luminosity = $20ab^{-1}$. A 50GeV binning was done and the last bin had events between 10 and 20. The dotted line shows 2σ line and the right plot zooms in to illustrate the 2σ cutting point for the given luminosity and c.m. energy.
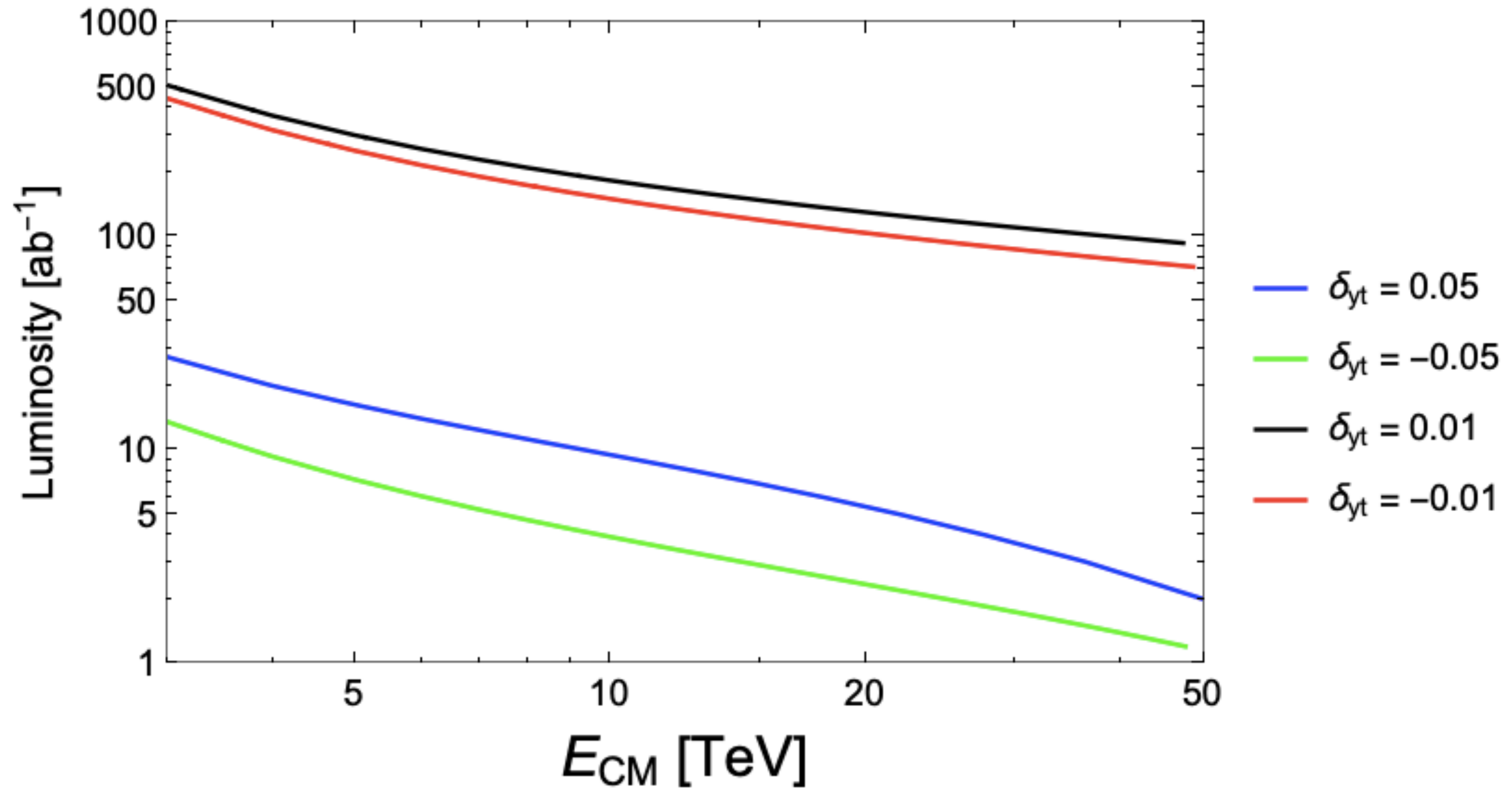
The figure shows the 2σ sensitivity for a 14TeV muon collider to the parameters δ_{yt} and luminosity. 50GeV binning was done throughout the whole spectrum, no special last binning was created for this plot.

Comparison with Muon Smasher Paper

H. Al Ali et al. , "The Muon Smasher's Guide," arXiv:2103.14043 [hep-ph]
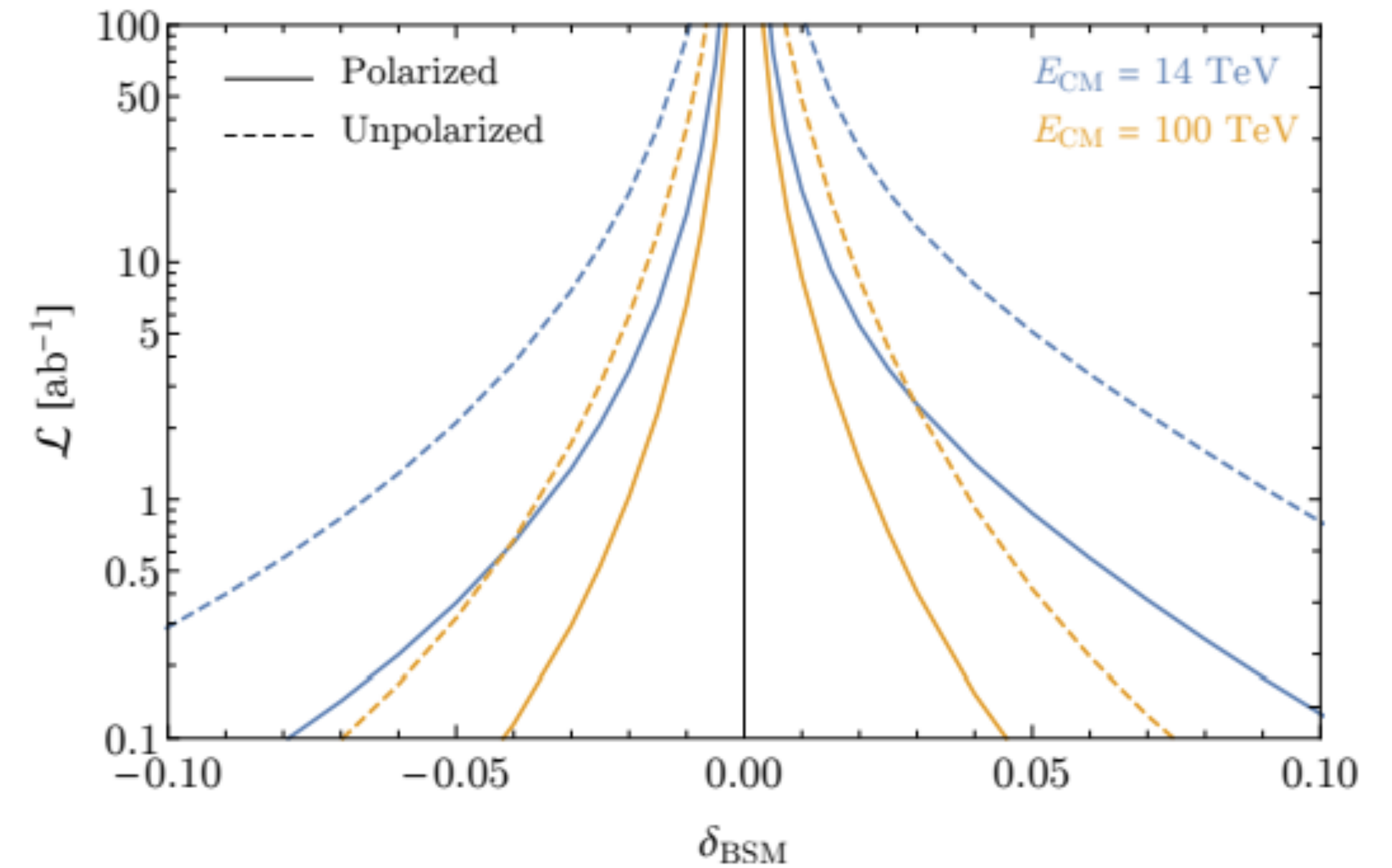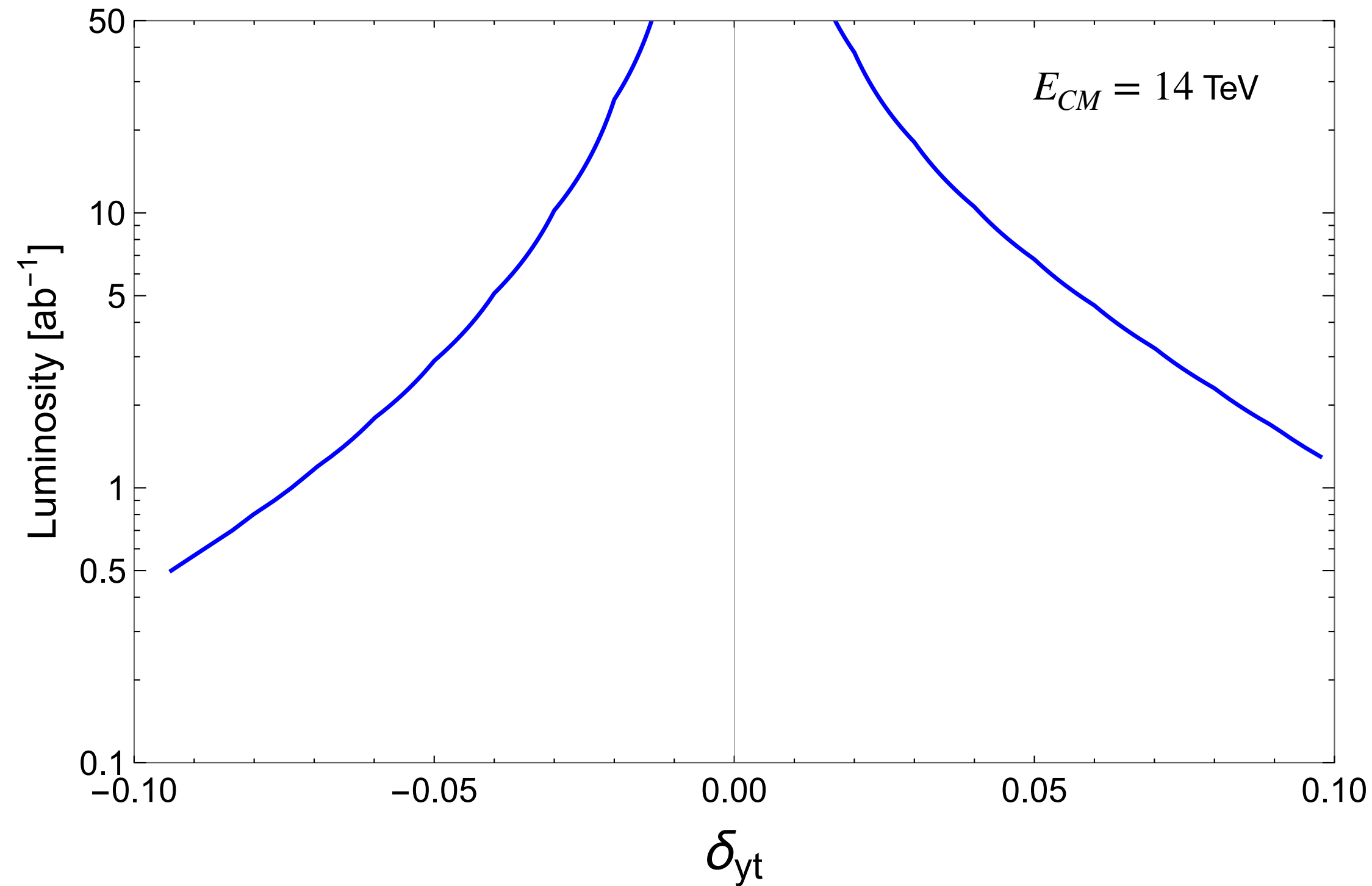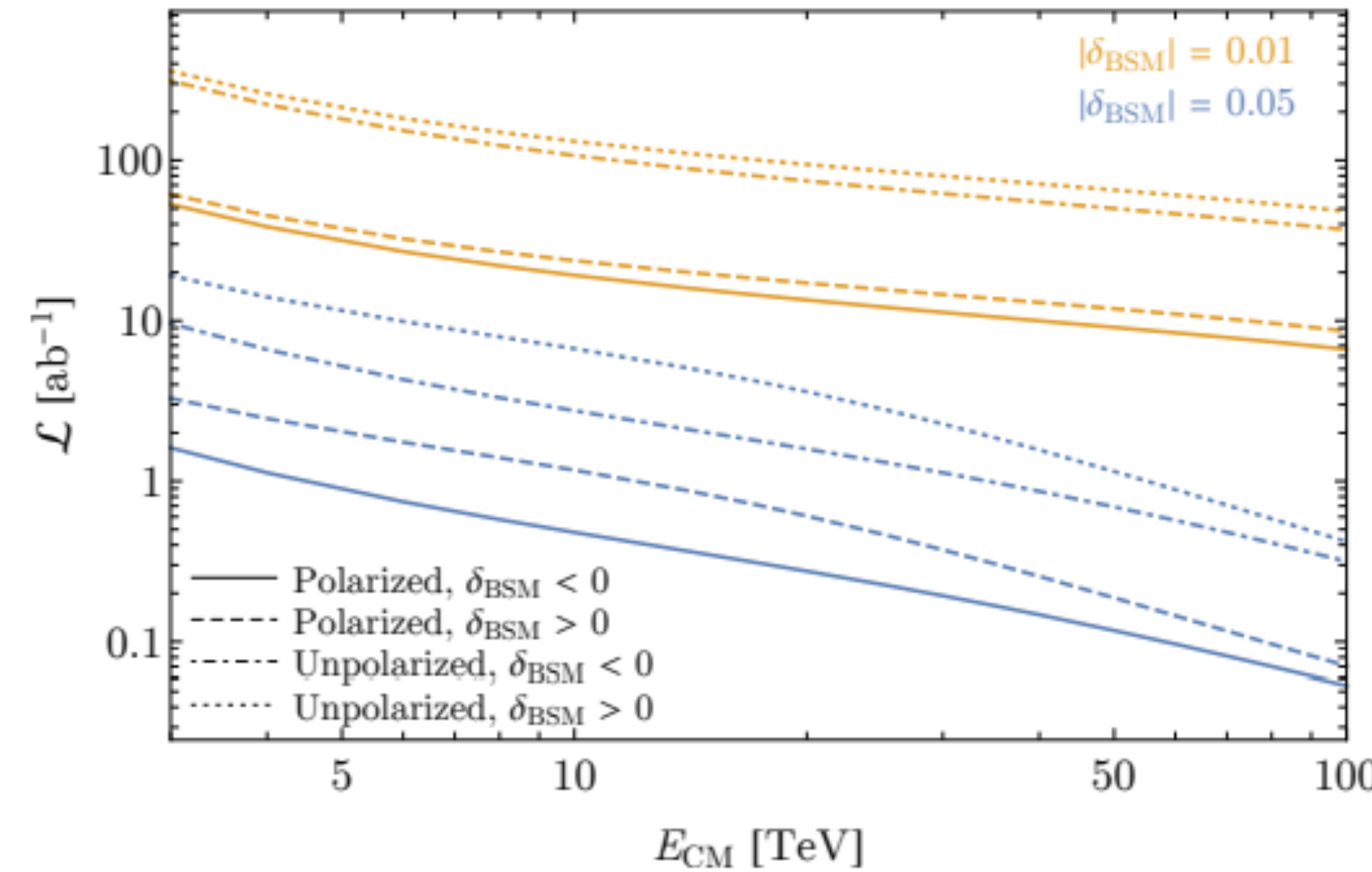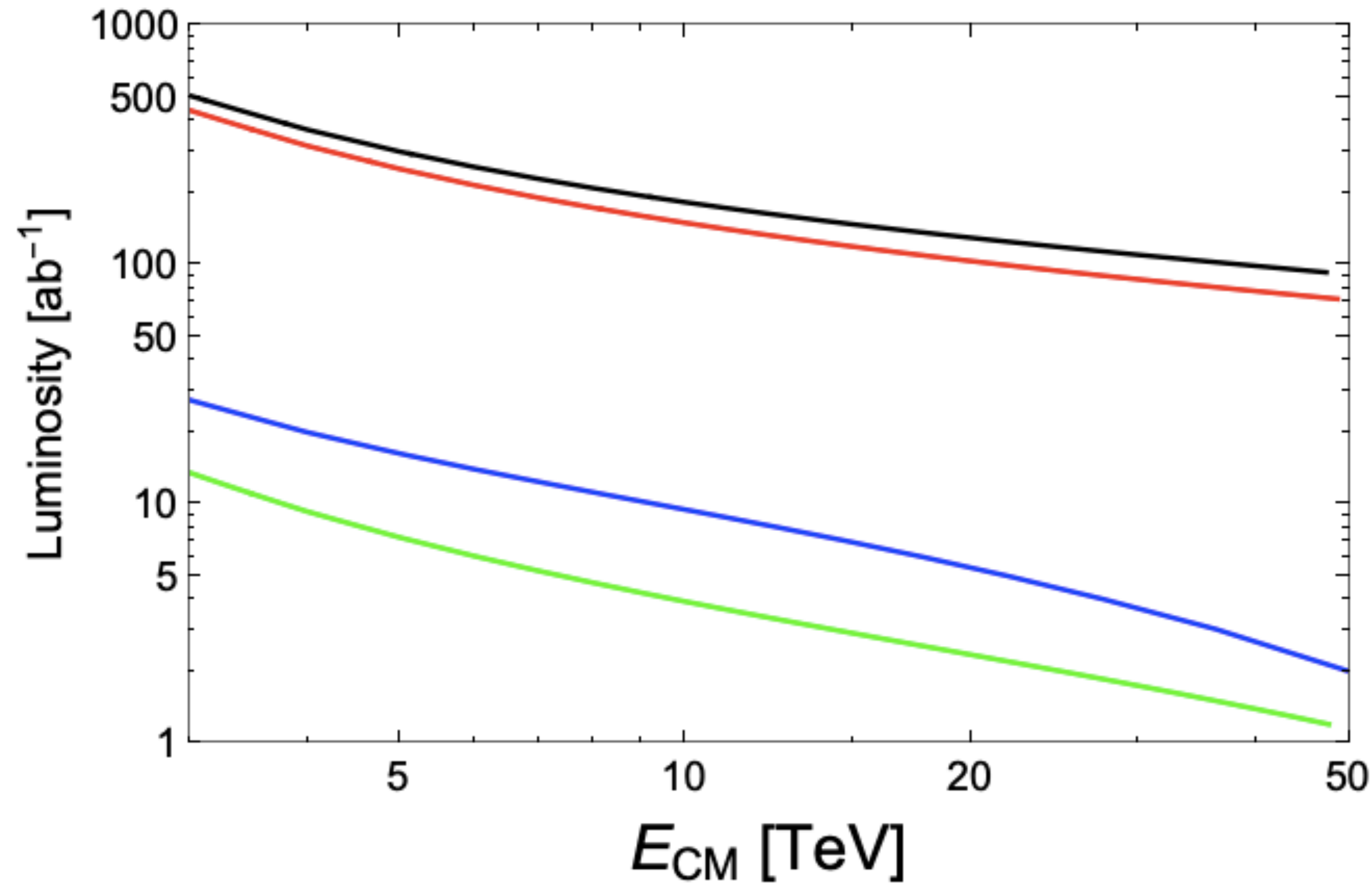
Comparing with the dotted blue line of the righthand plot, one does see relatively good agreement between the two results. The muon smasher plot, they took the luminosity upto $100ab^{-1}$, I took it upto $50ab^{-1}$ to create my plot

The figure shows the 2σ sensitivity for a muon collider to the parameters E_{CM} and luminosity for four possible values of δ_{yt}. 50GeV binning was done throughout the whole spectrum, no special last binning was created for this plot.
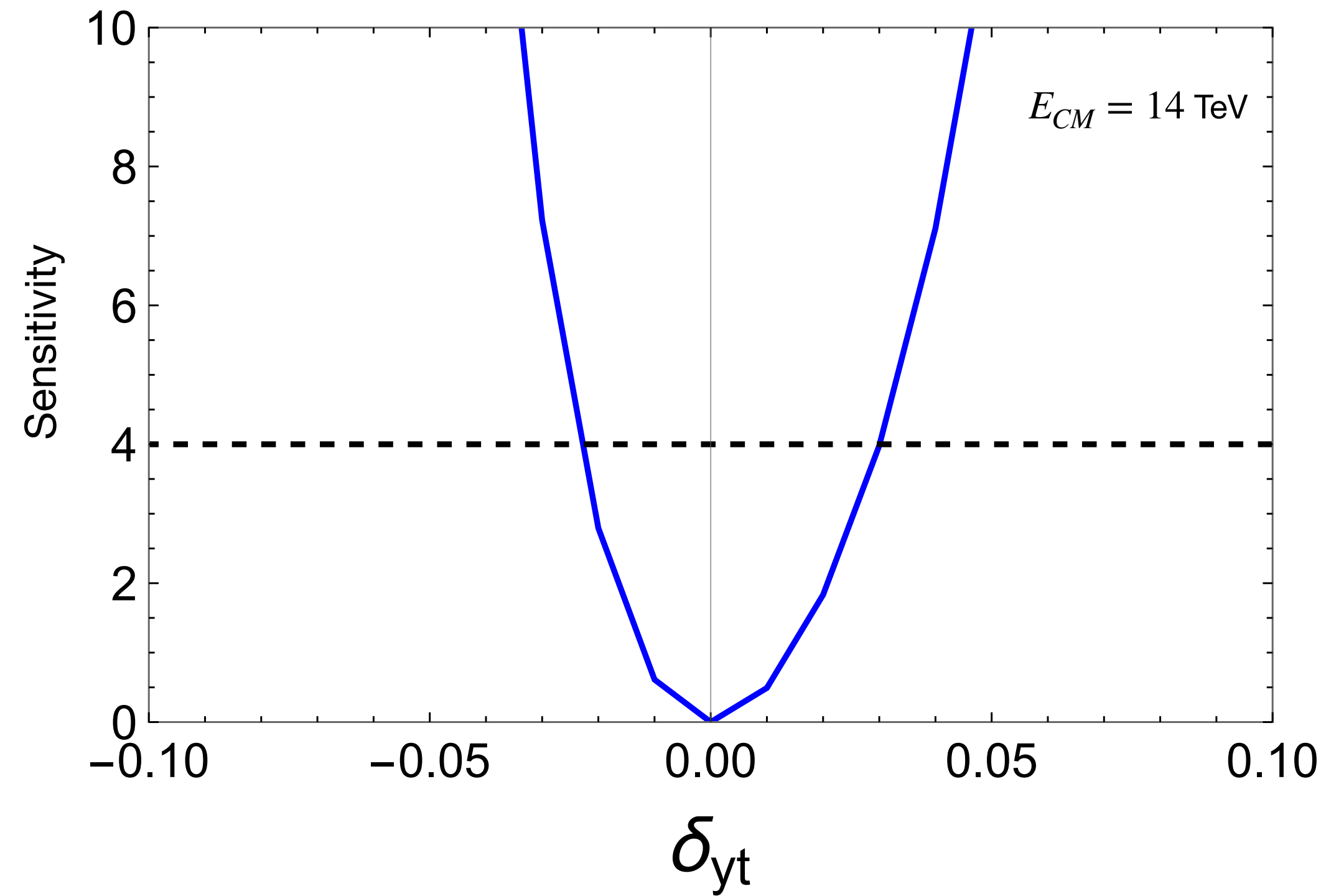
Comparison with Muon Smasher Paper

H. Al Ali et al. , "The Muon Smasher's Guide," arXiv:2103.14043 [hep-ph]
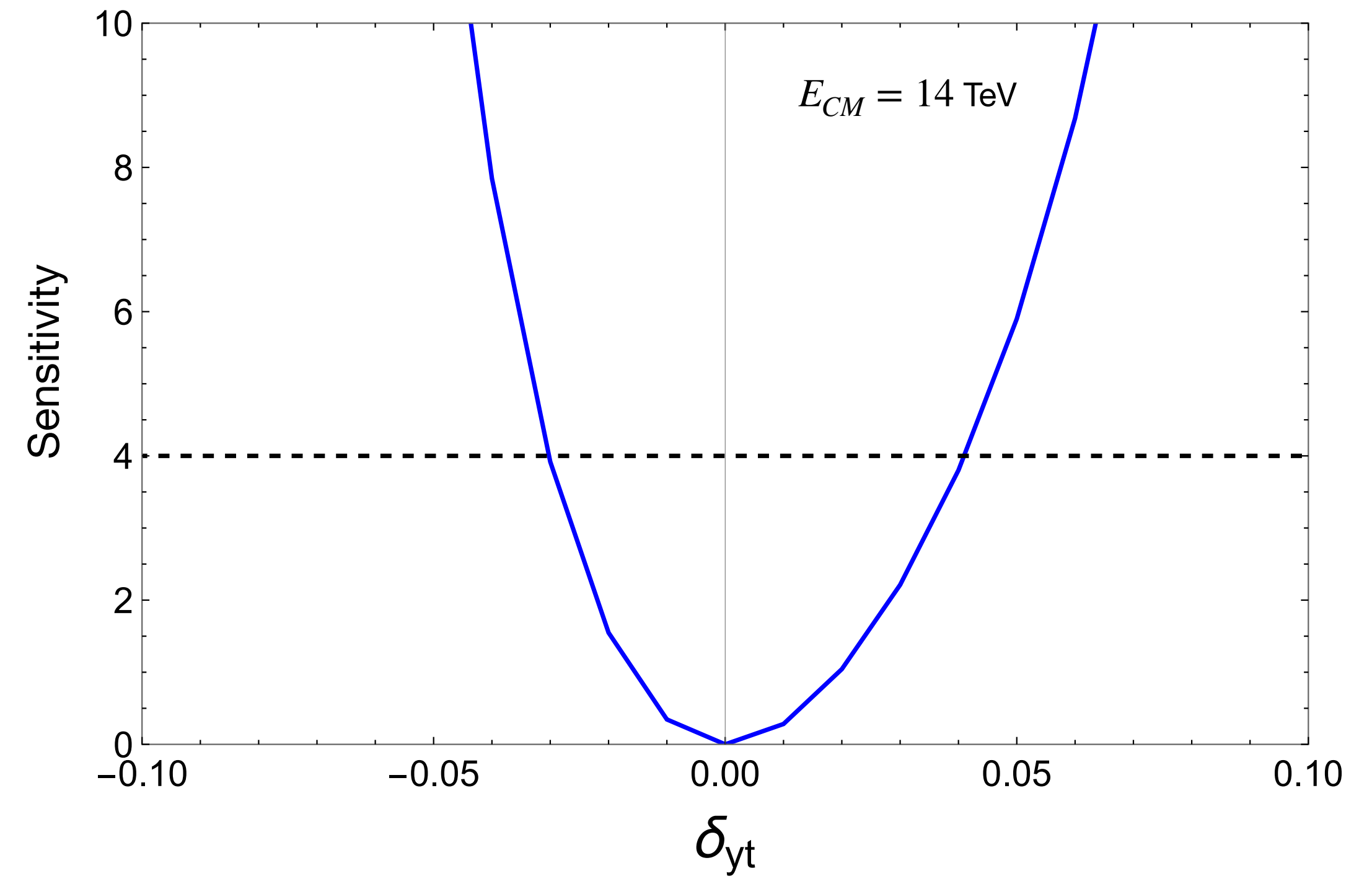

Comparing the dotted orange and blue lines of the right hand plot, one can see around 20% discrepancy between the plots. In general, the shapes are similar.

Sensitivity for Luminosity = $10ab^{-1}$ and E_{CM} = 14TeV with an angle cut
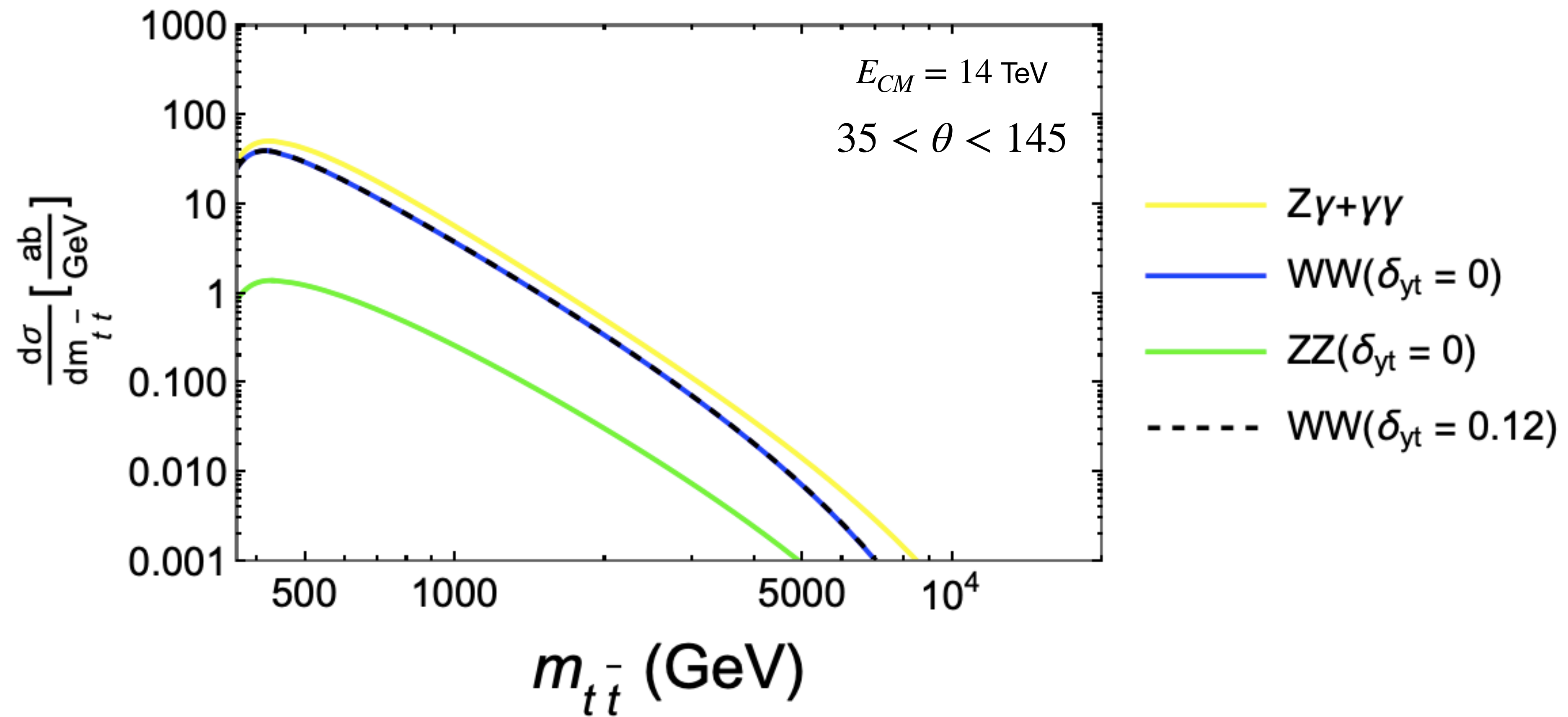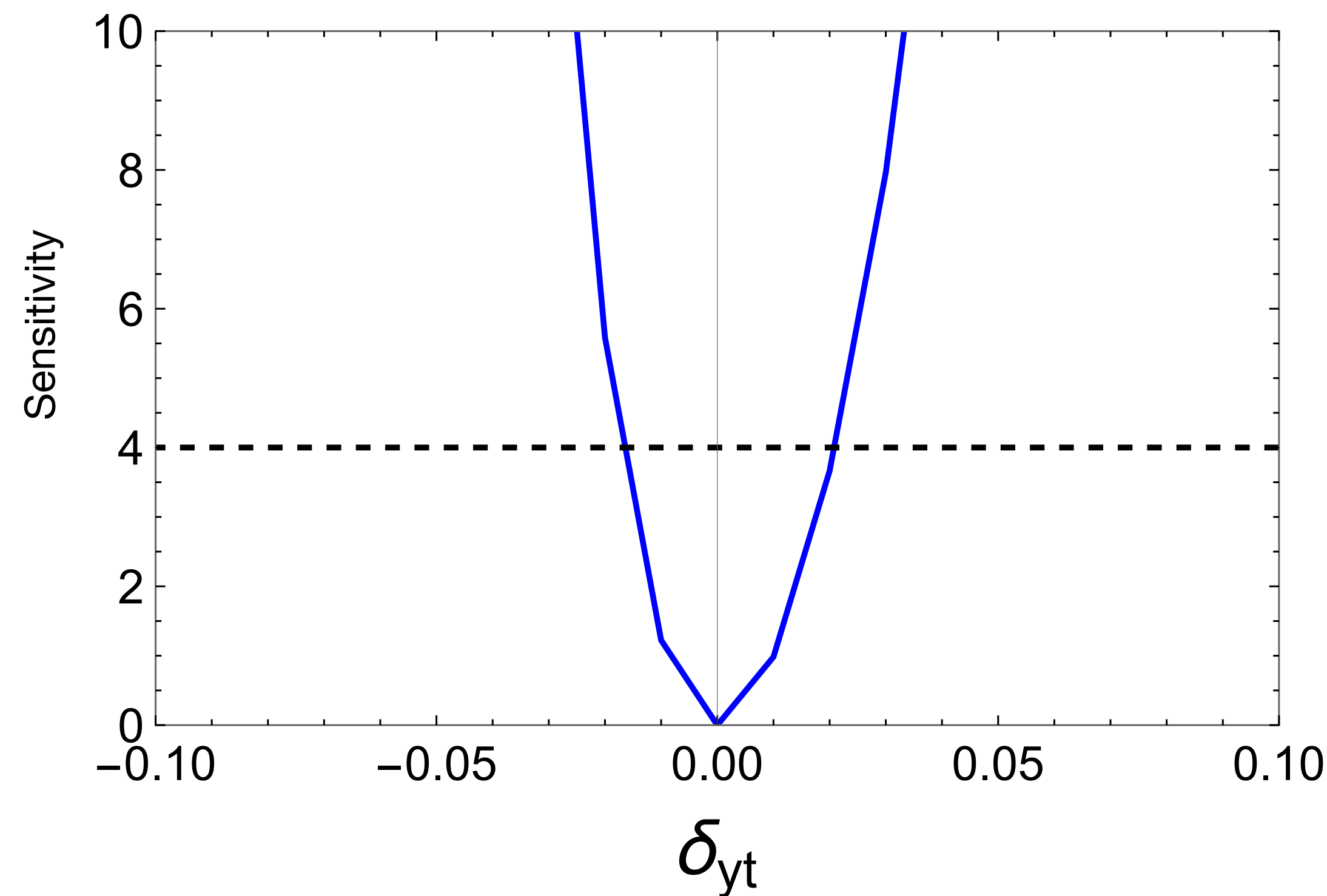

With angle cut

Without angle cut

I am not sure if this is doable in the experiment, but I took events with angle $35 < \theta < 145$, made a plot shown in slide 8, and then found the sensitivity following procedures of binning as in previous slides. It shows increased sensitivity for angle cuts.
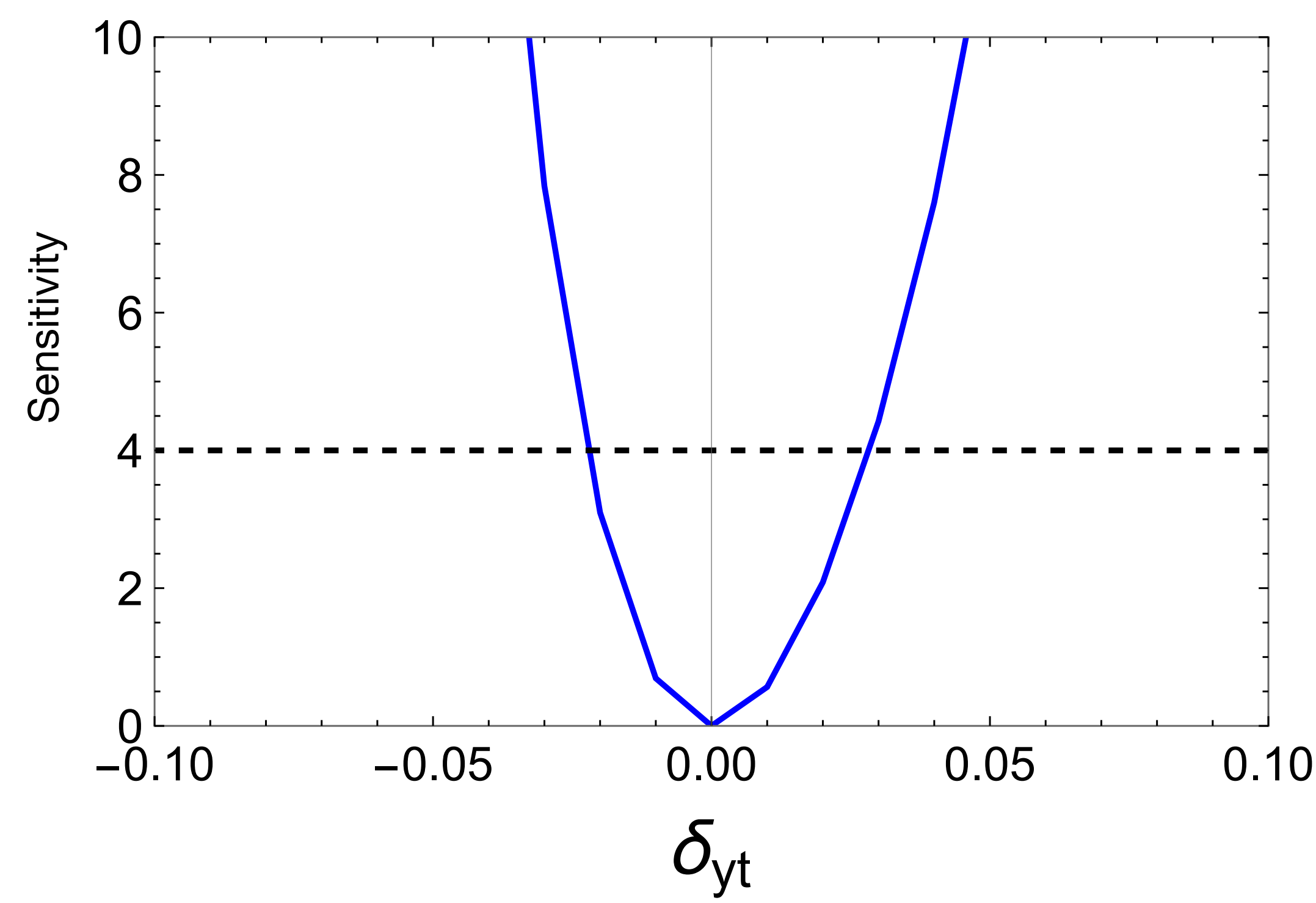
Sensitivity for Luminosity = $10ab^{-1}$ and E_{CM} = 14TeV with an angle cut

Sensitivity for Luminosity = $20ab^{-1}$ and E_{CM} = 14TeV with an angle cut

With angle cut

Without angle cut

Luminosity = $20ab^{-1}$