The Galactic Center γ-ray Excess: Dark Matter & Pulsar Interpretations

Kevork Abazajian

UC Irvine
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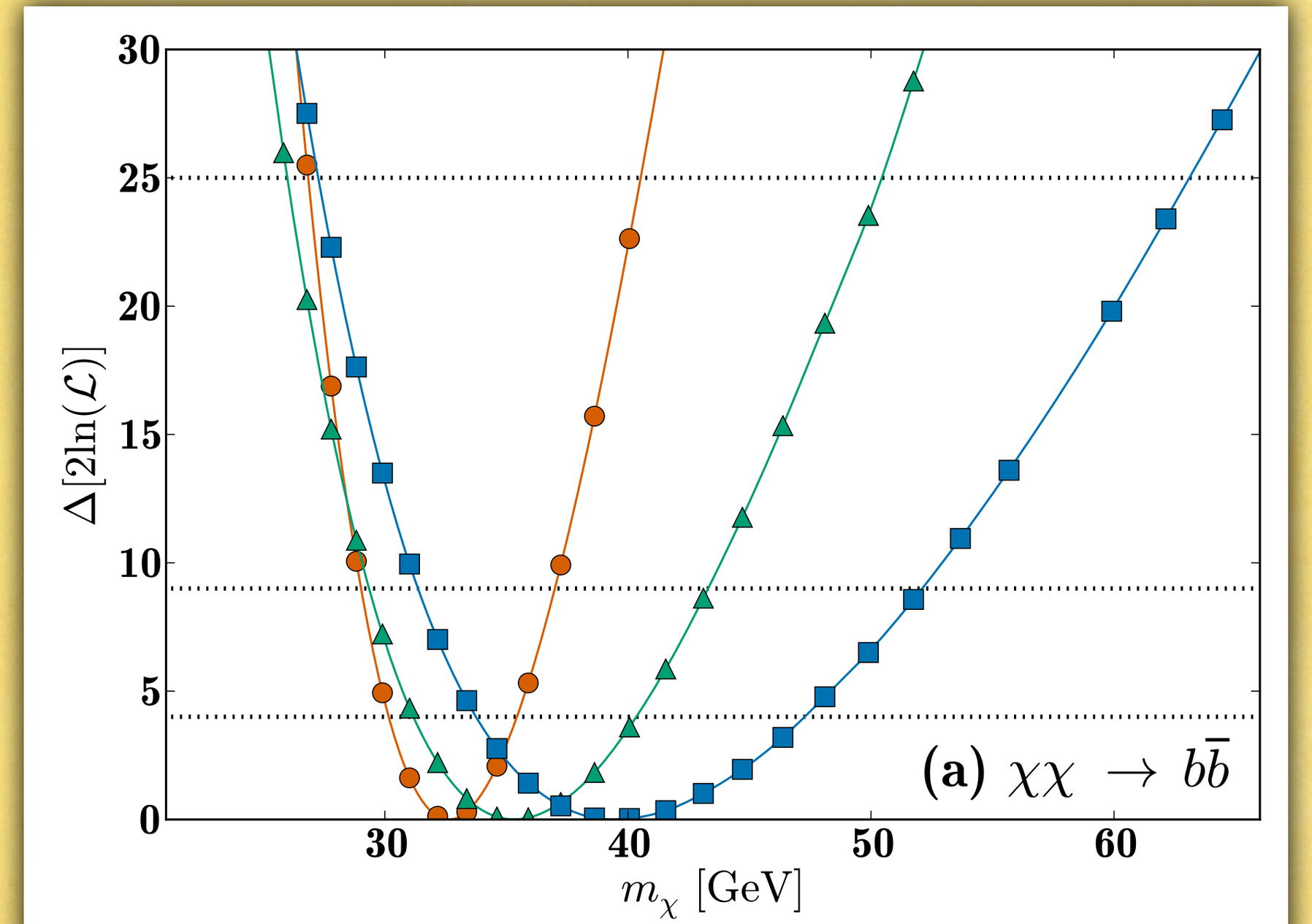
Signal Parameters: *which mass is favored*?

$$\chi + \chi \to b + \bar{b} : m_\chi = 39.4(^{+3.7}_{-2.9}\ \text{stat.})(\pm 7.9\ \text{sys.})$$



Abazajian et al. arXiv:1402.4090

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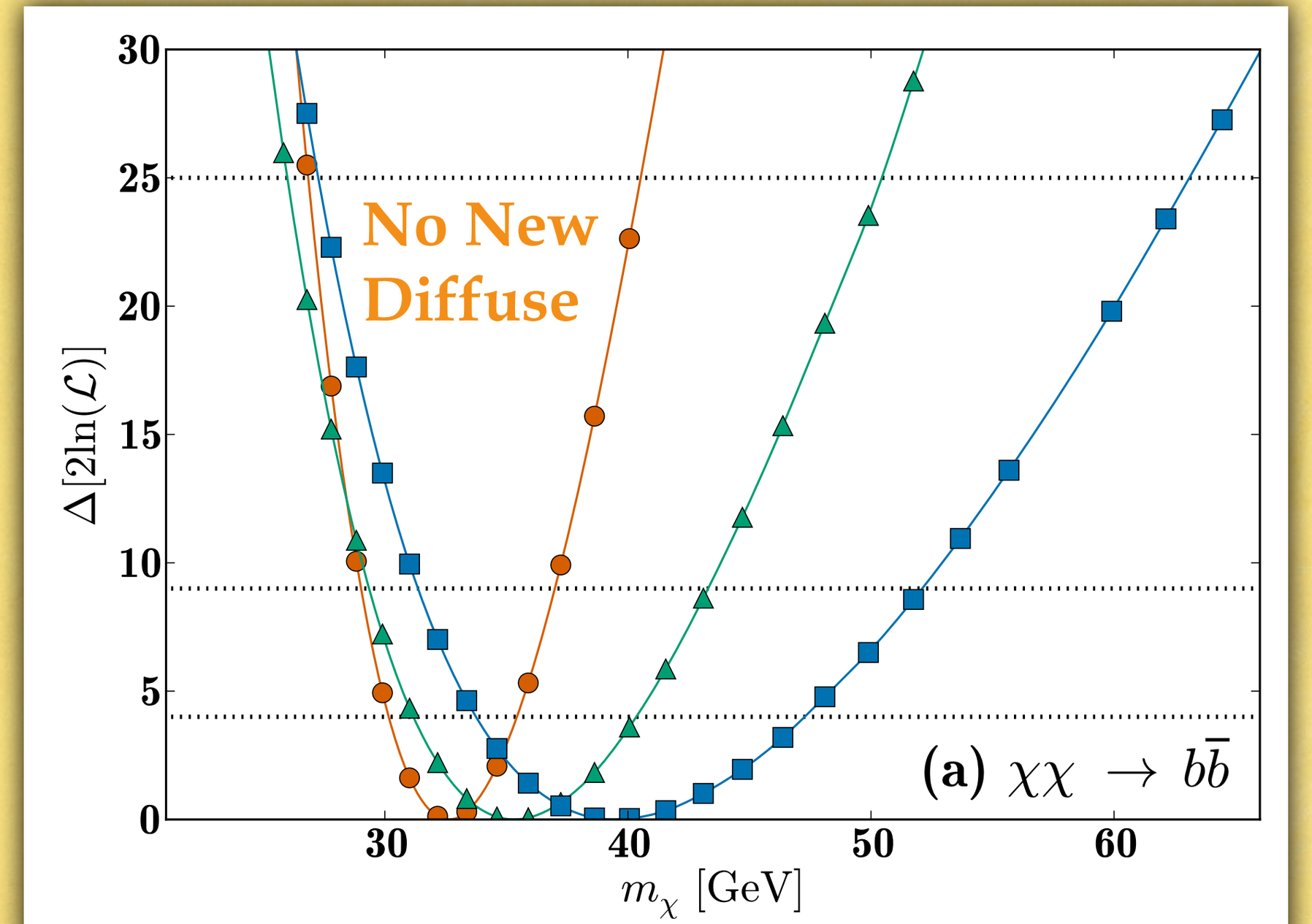

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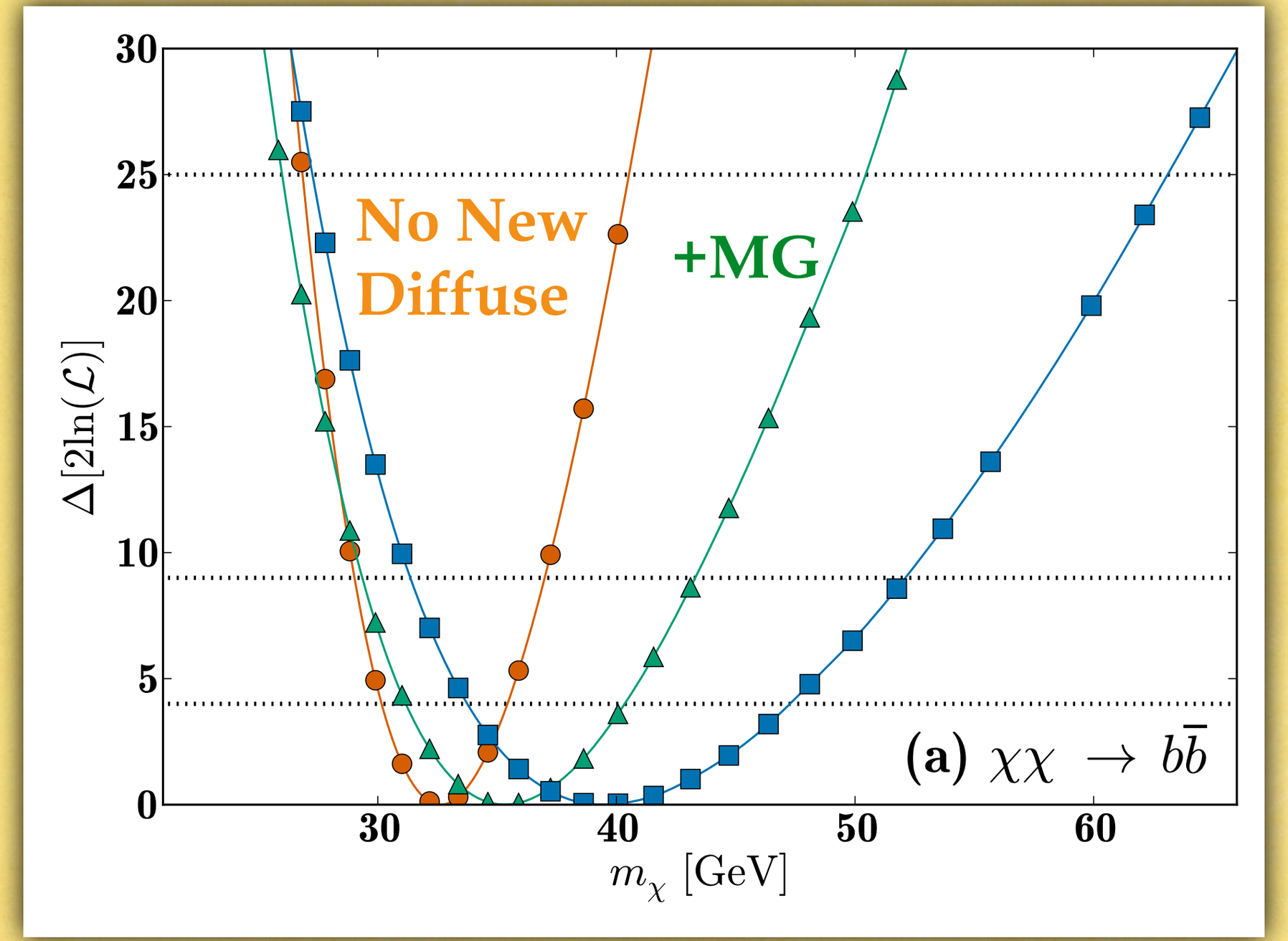

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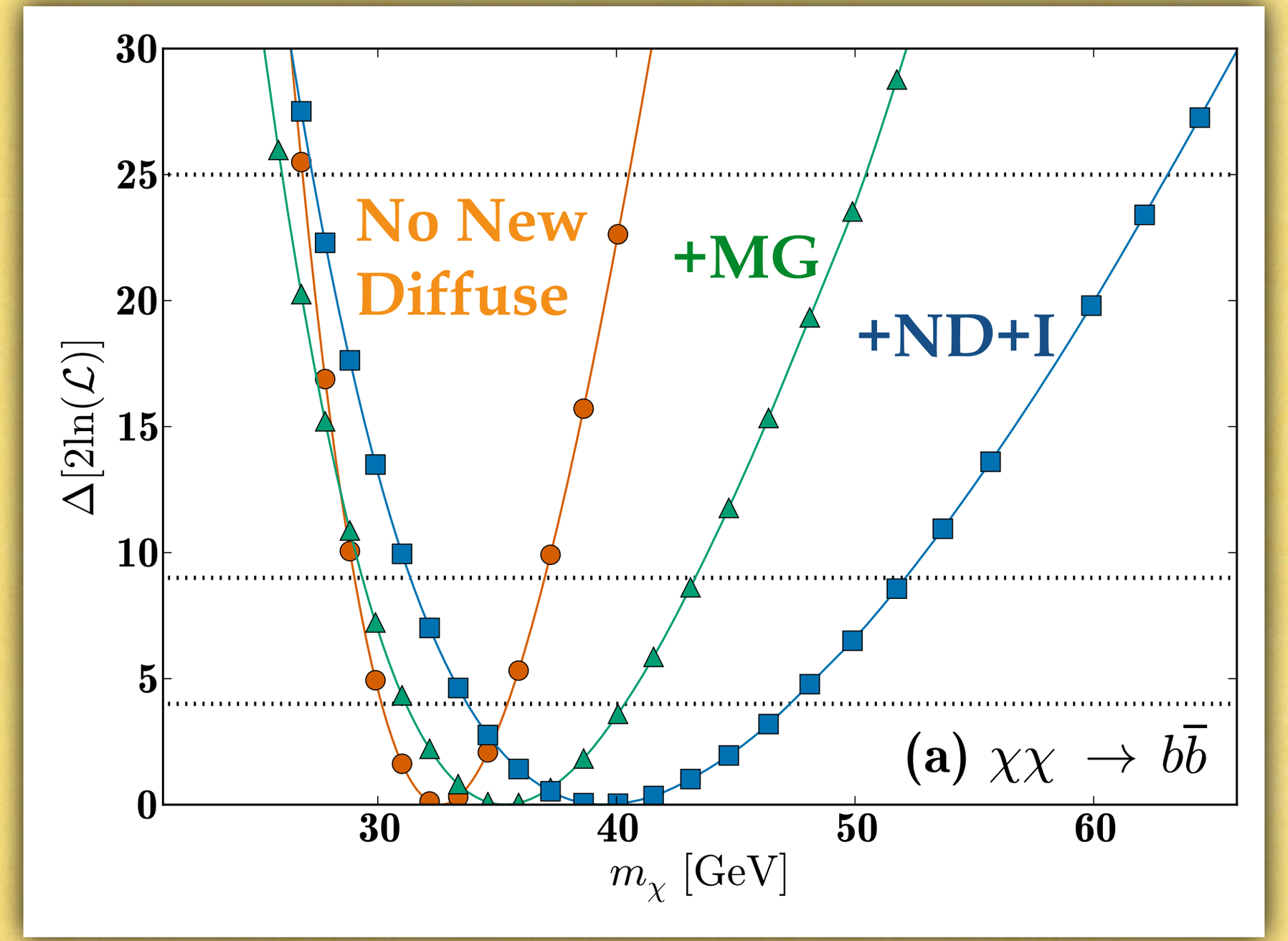

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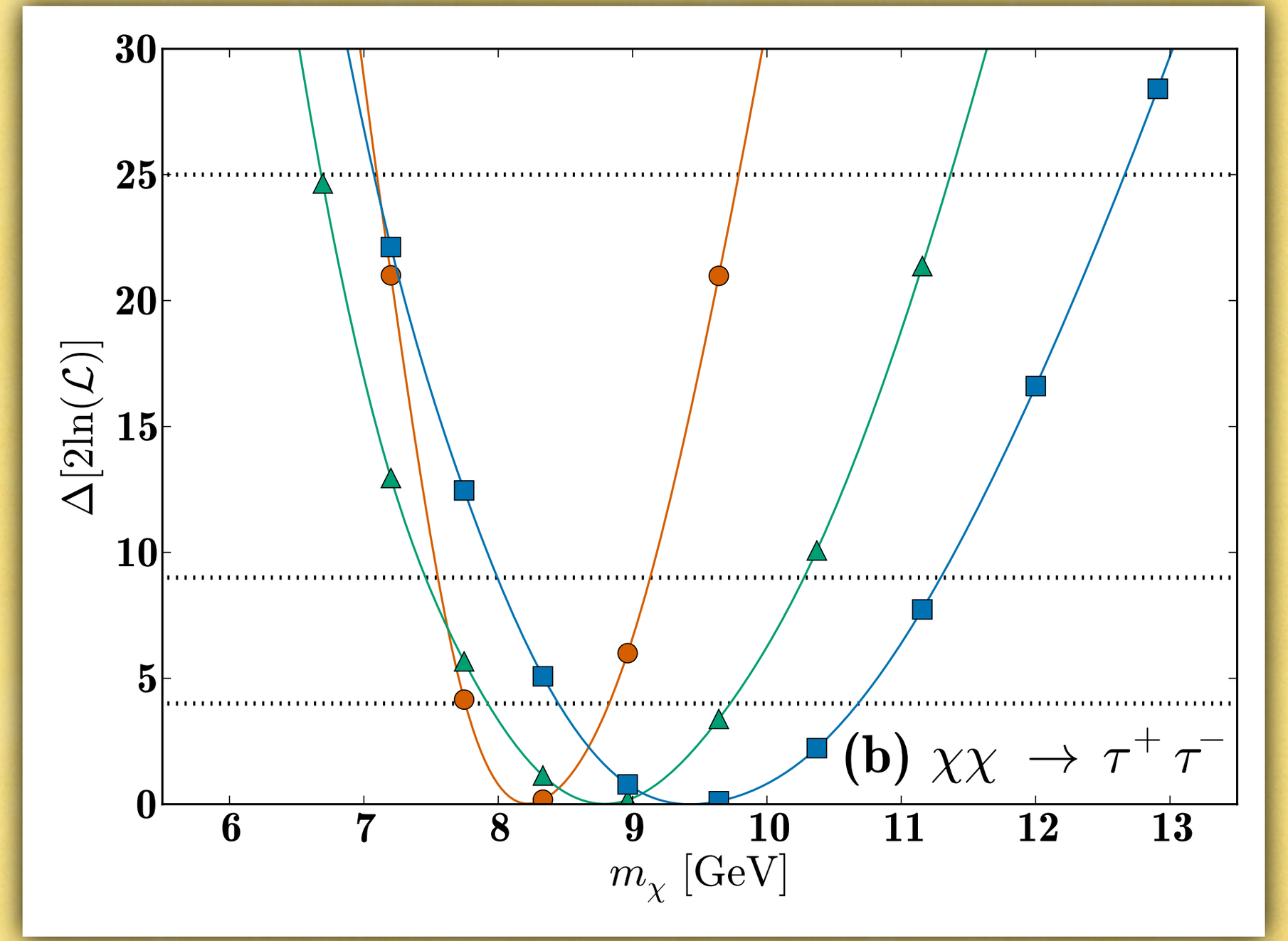

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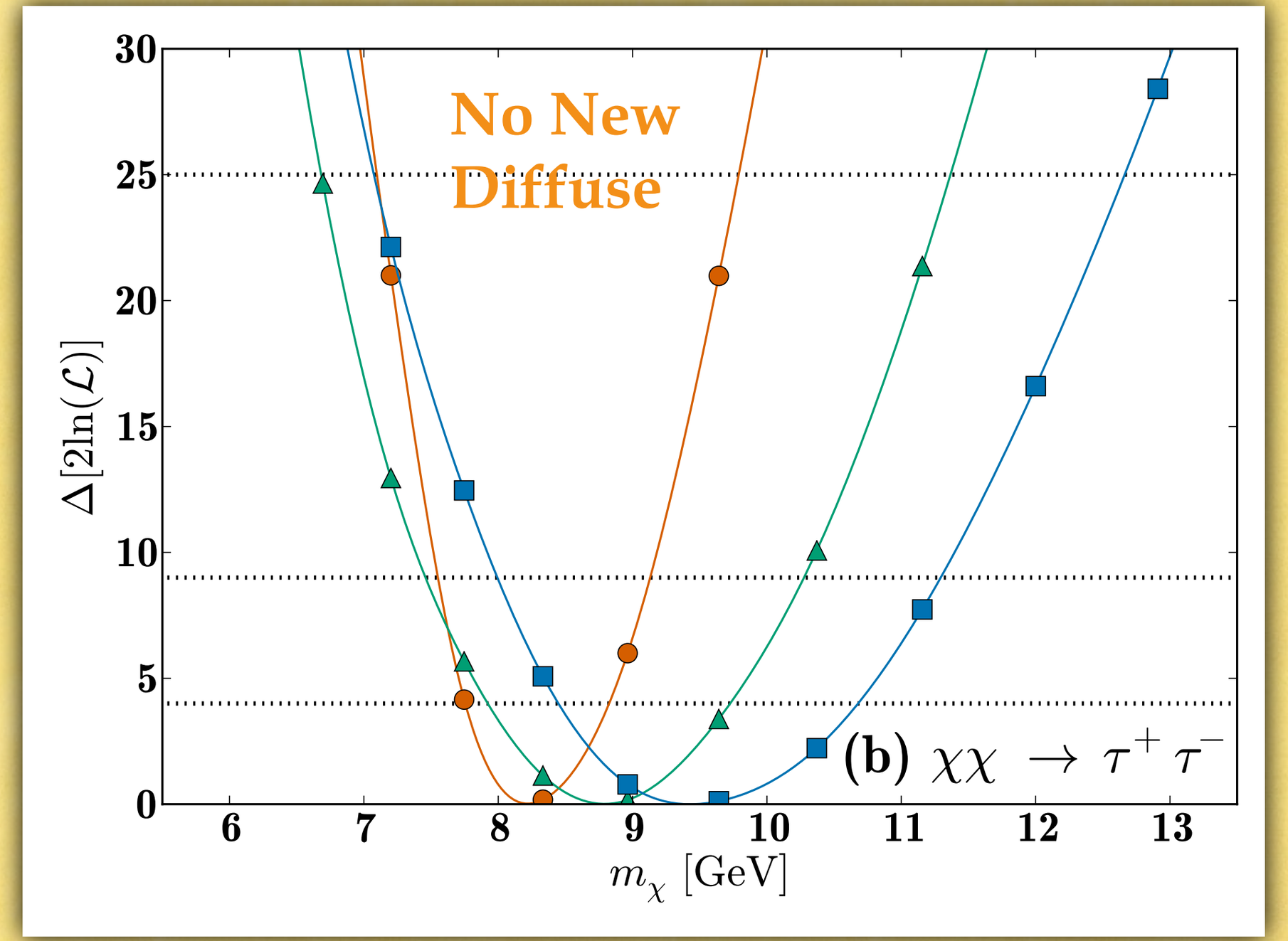

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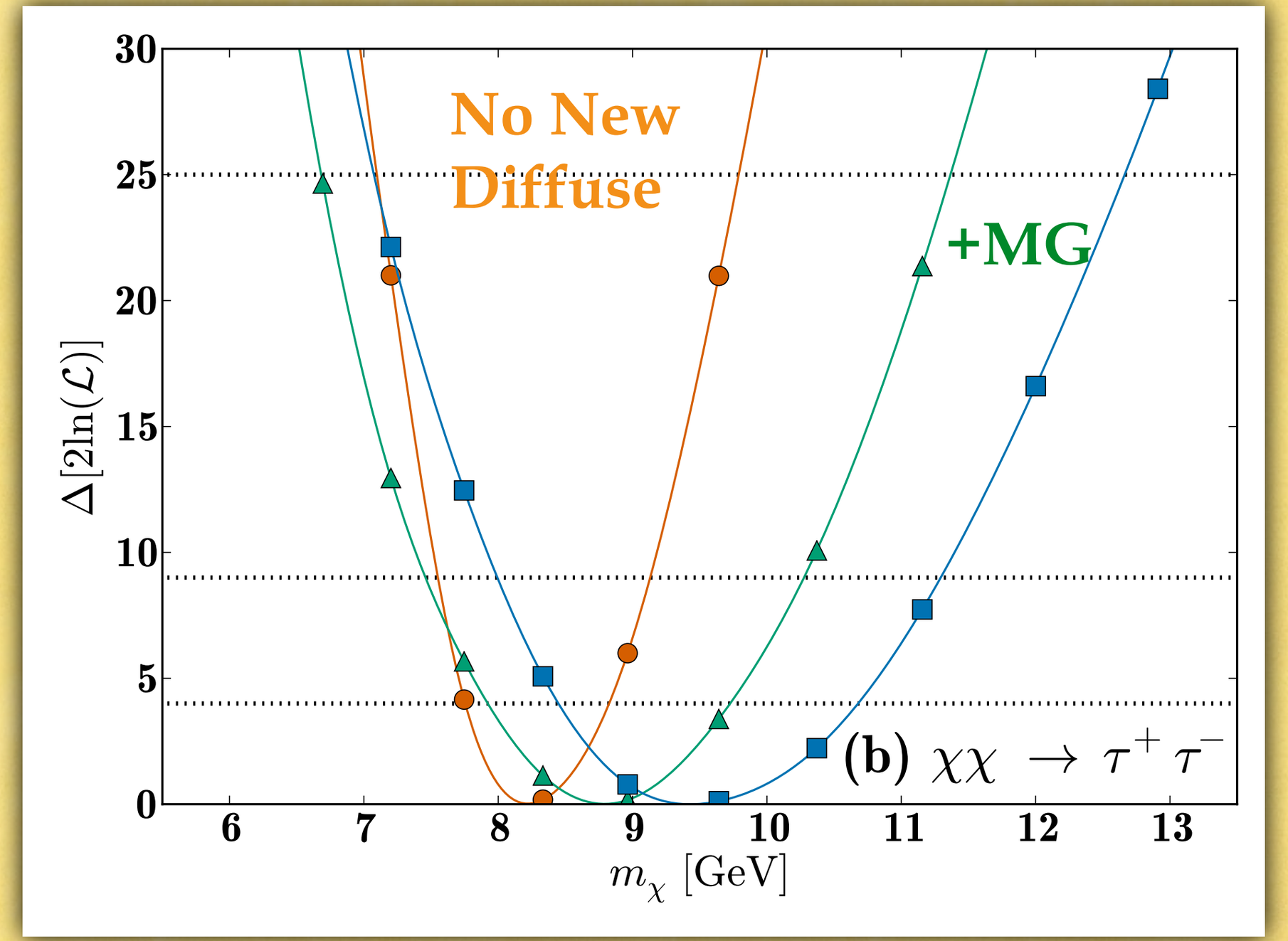

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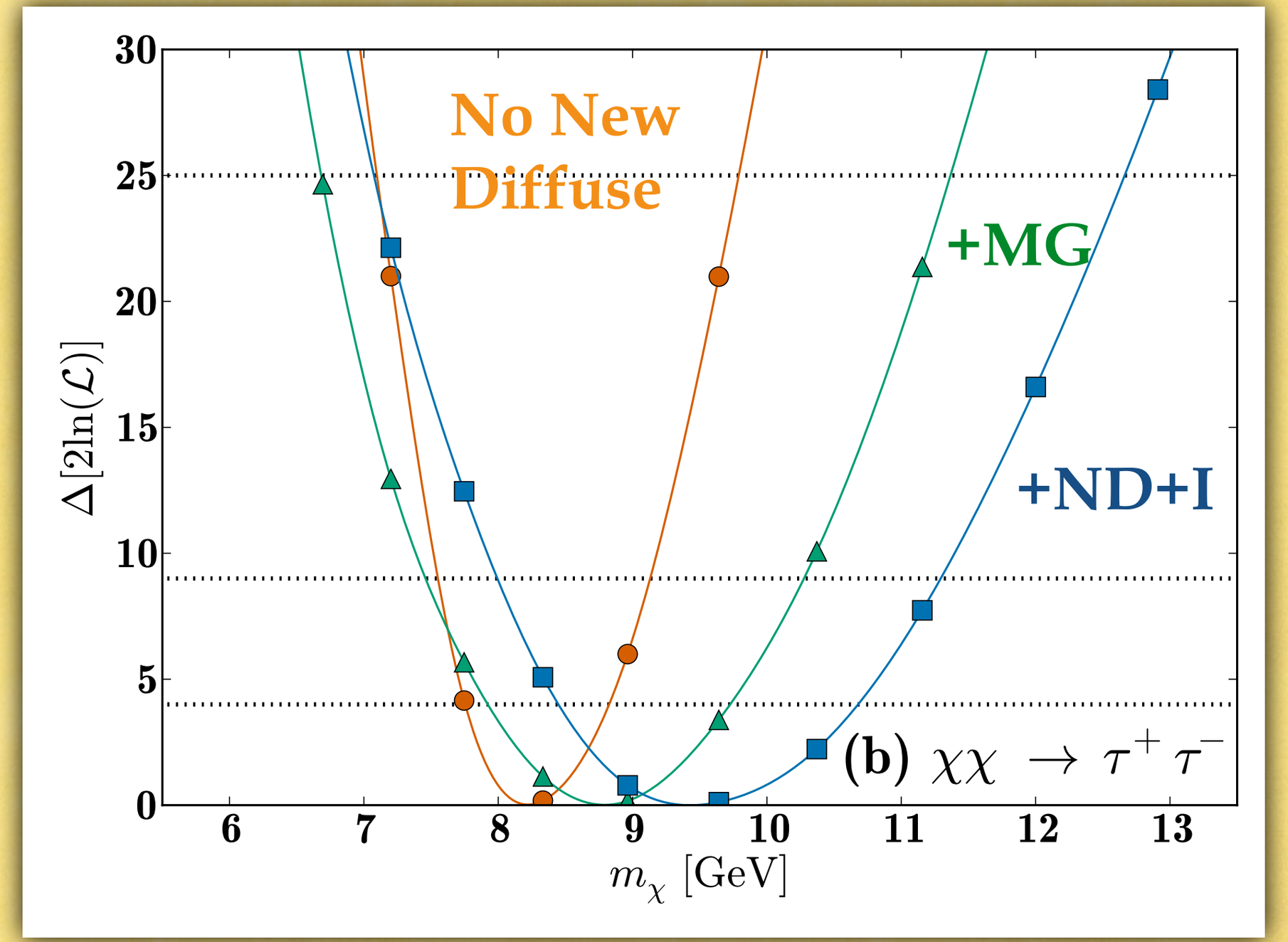

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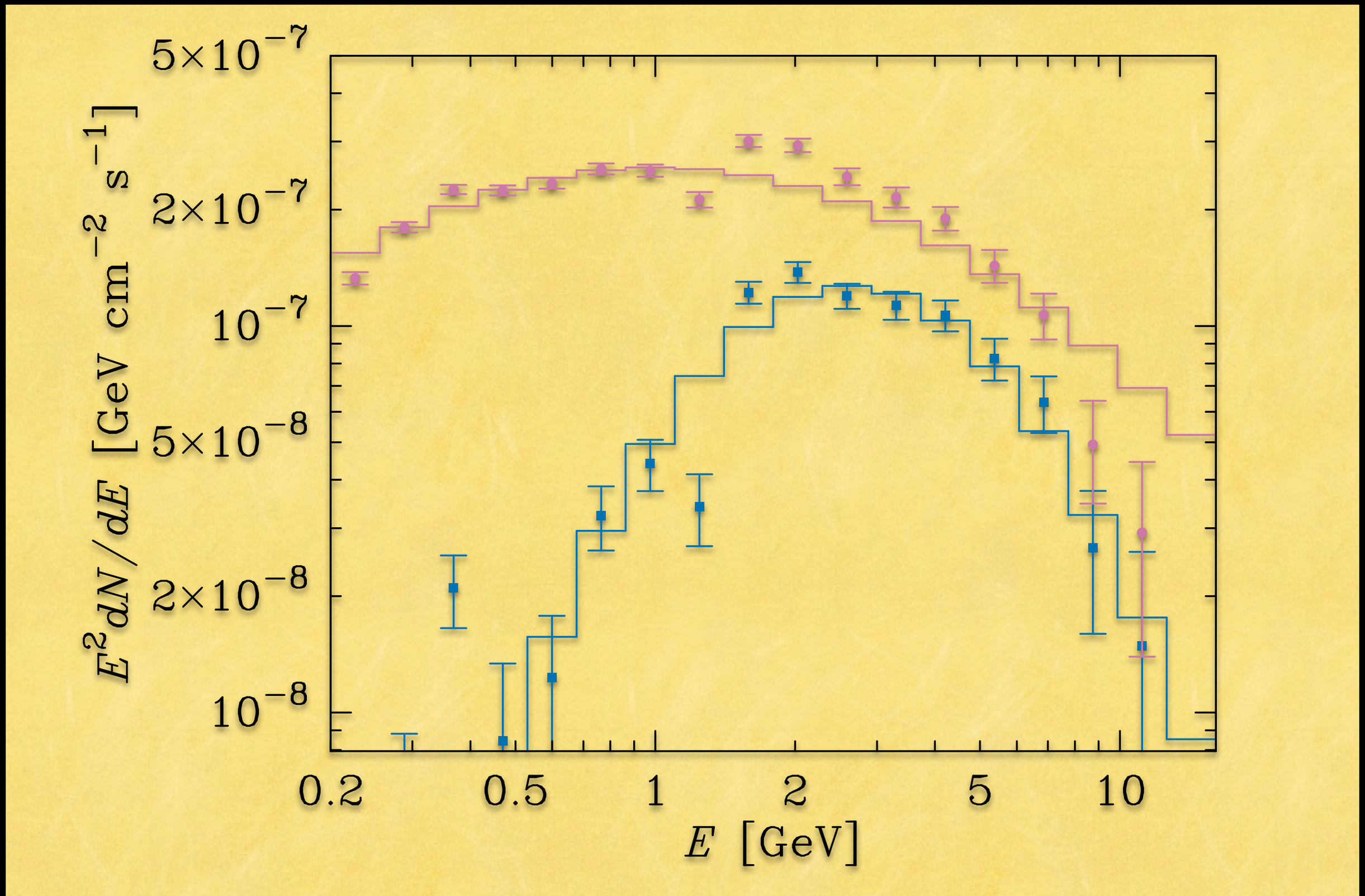
Effects of Diffuse Gas Emission Addition



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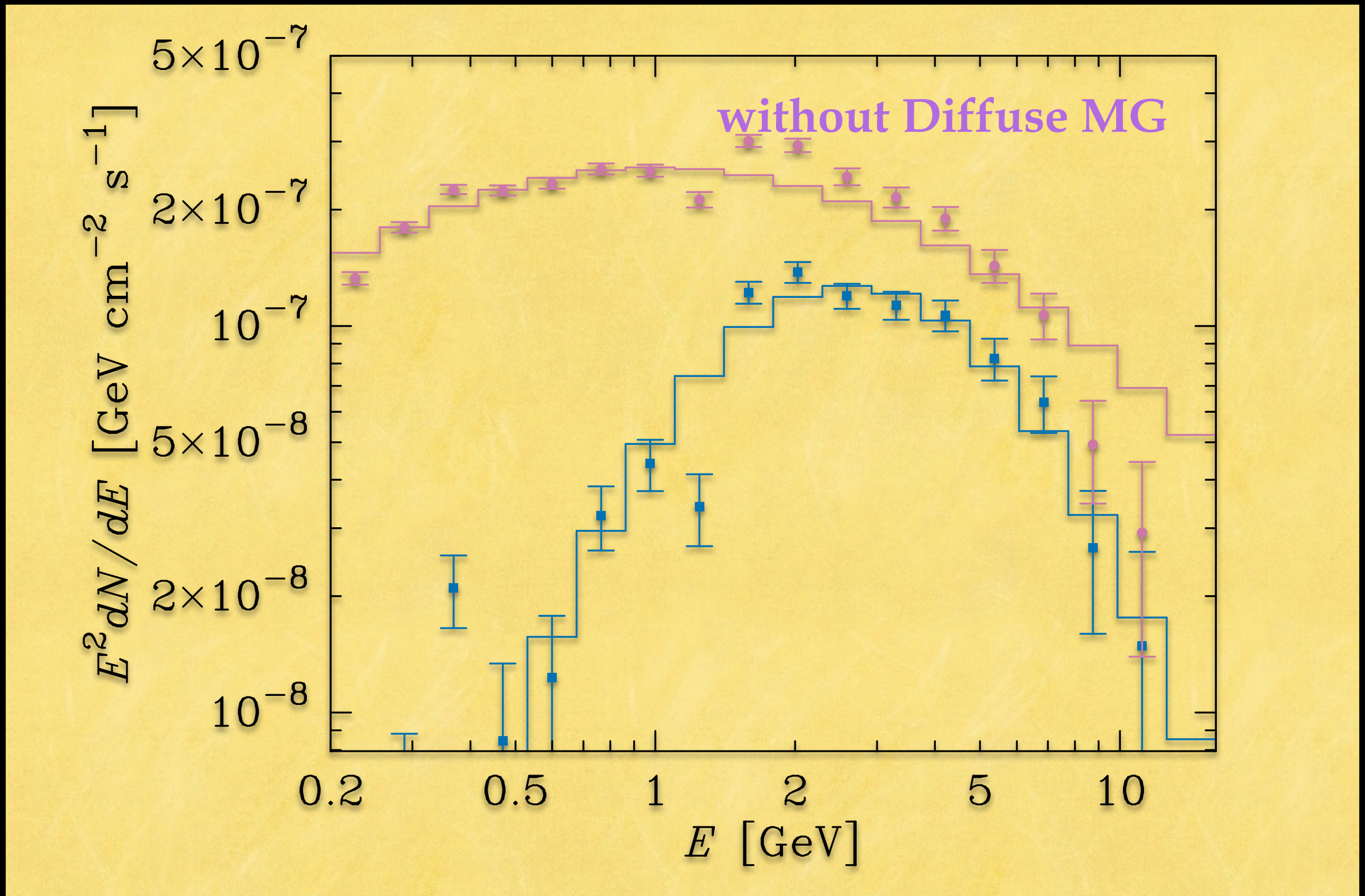

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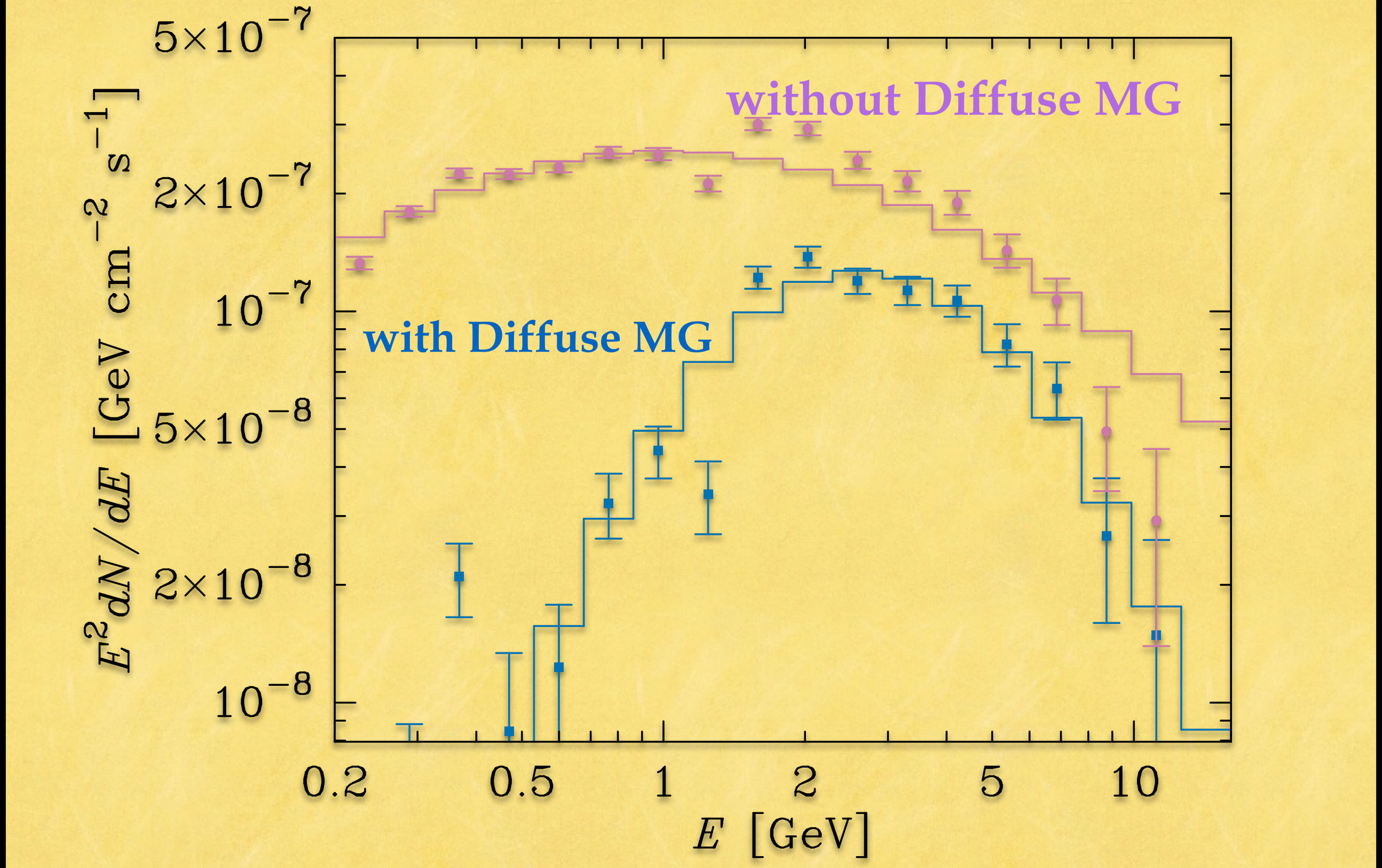
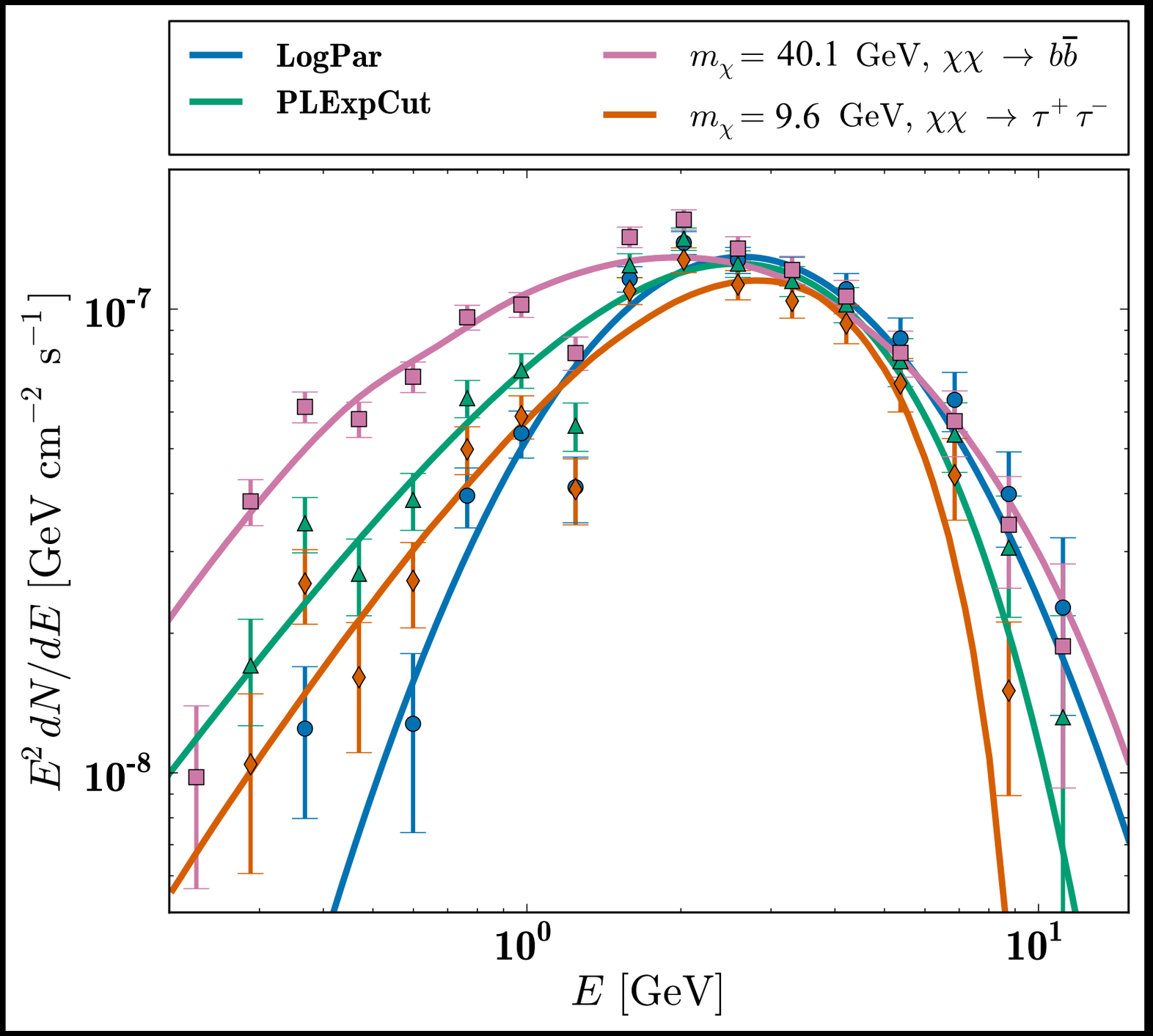
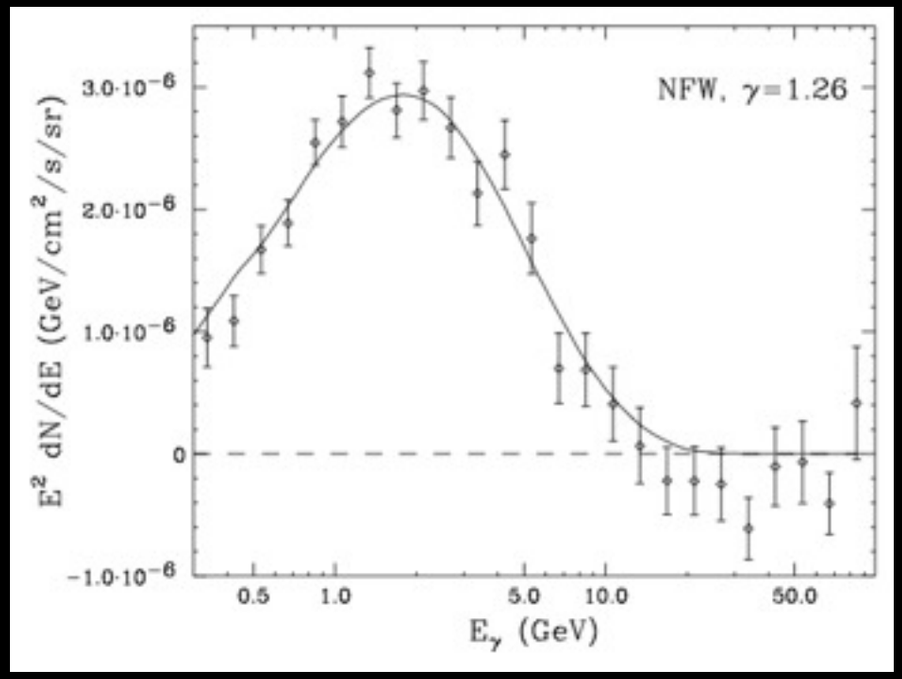


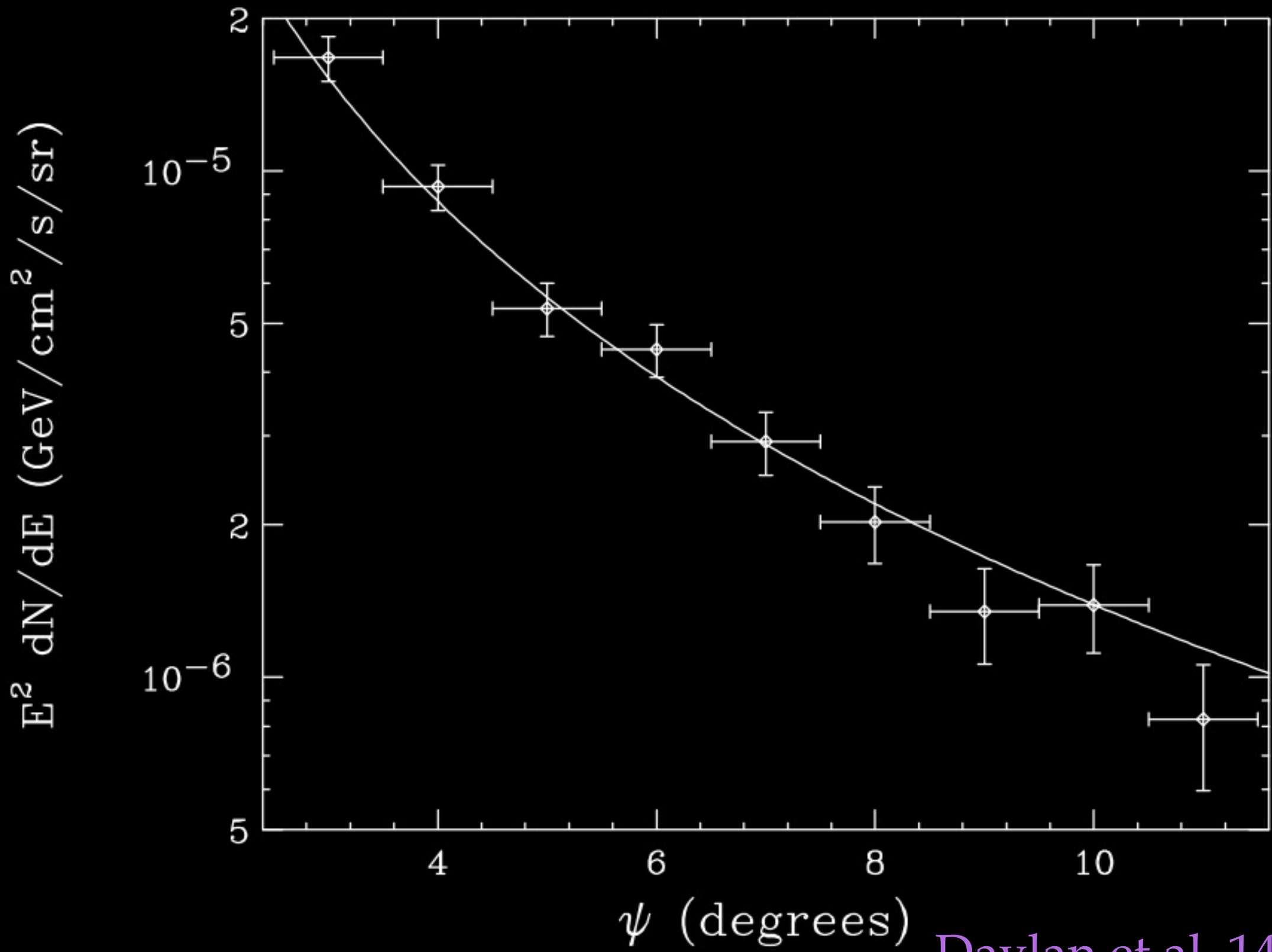
Effects of the Assumed Spectral Form



Daylan et al. 1402.6703



GCE Spatial Extent is Enormous



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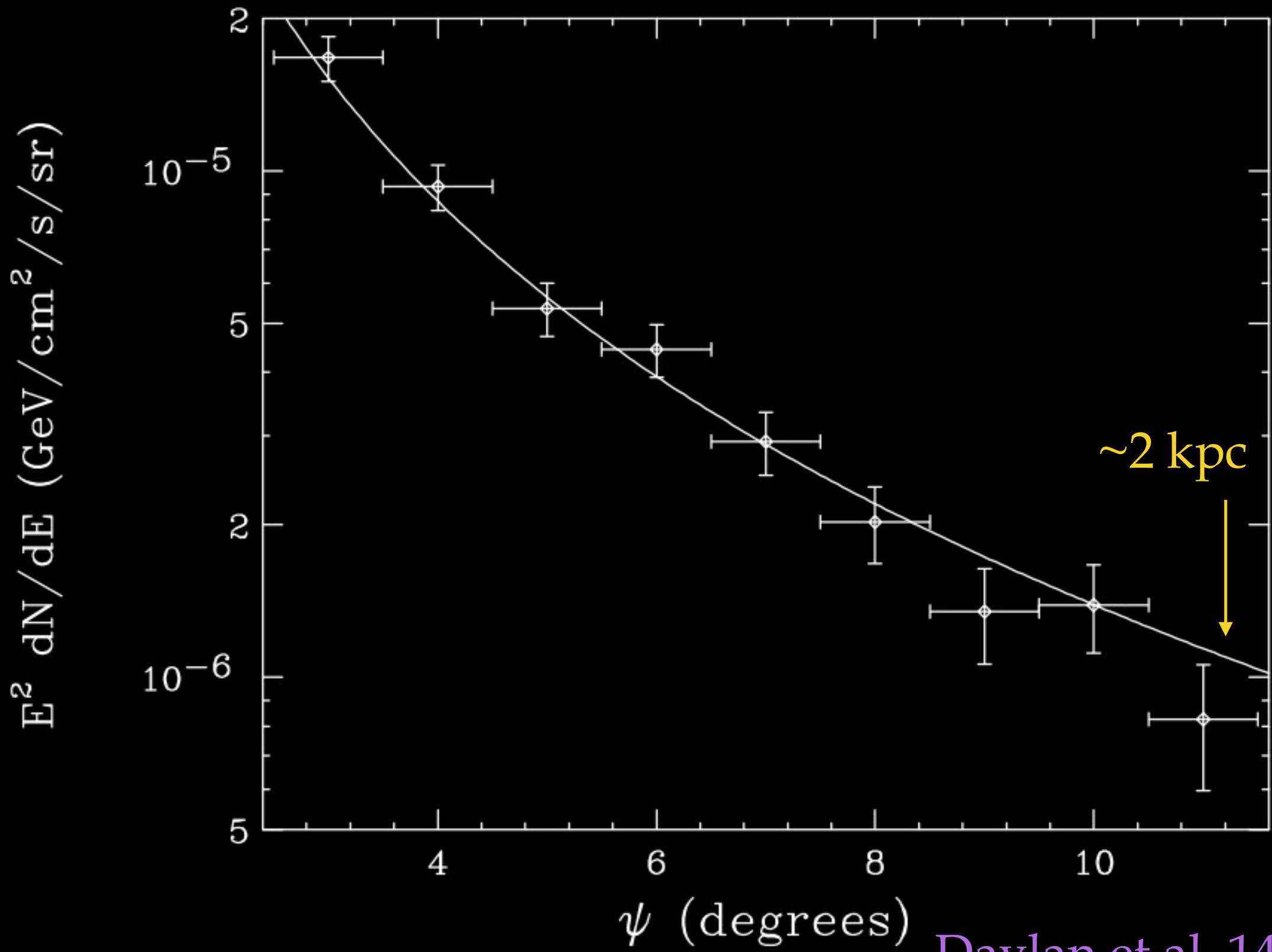

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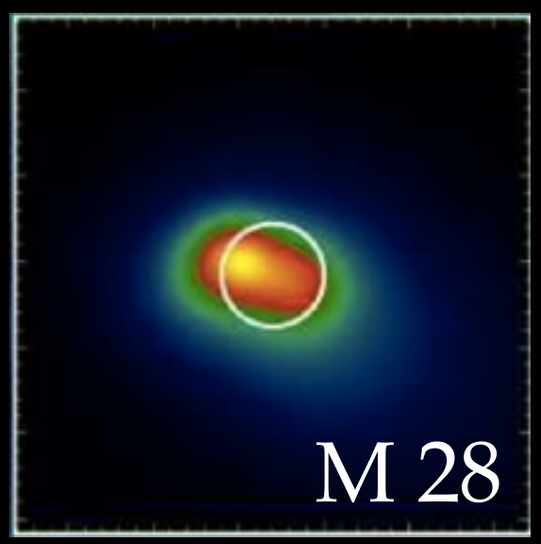
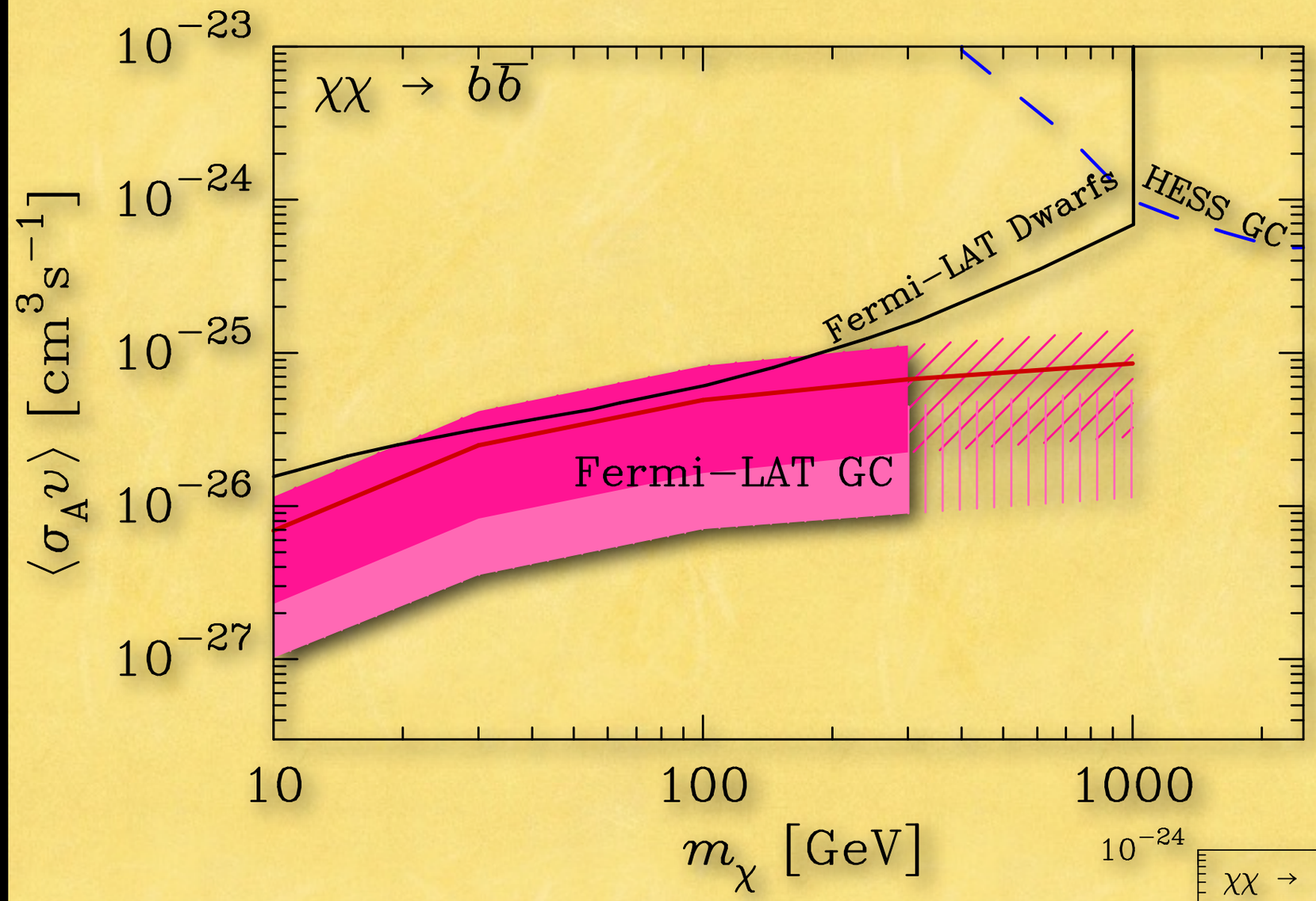
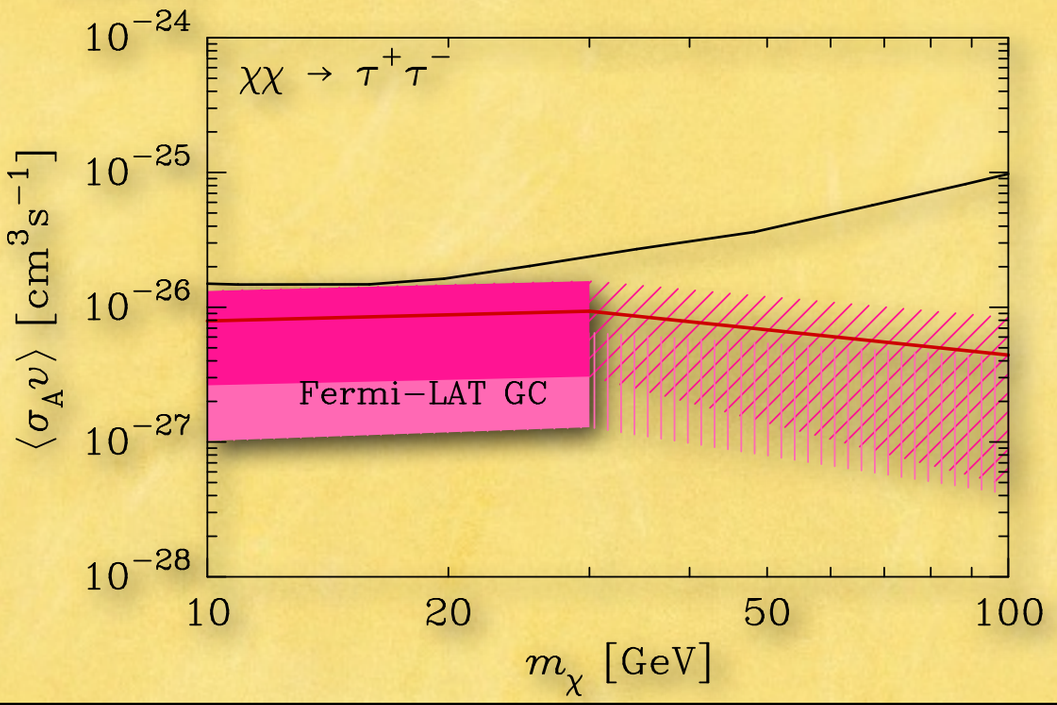
Gamma rays from Millisecond Pulsars in Stellar & Globular Clusters



- Requires the flux from the GC MSPs to be 200 times that in Omega Cen - reasonable stellar mass is 800 times
- Spectrum is consistent $\Gamma=0.45 \pm 0.21$ and $E_c = 1.65 \pm 0.2$ GeV
- Requires ~5000 MSPs in the GC region, very large, but again a reasonable scale
- Requires a centrally concentrated density profile $n \sim r^{-2.6}$, which is seen for the central density distribution of LMXBs in M31

Signal Parameters: forecasts for dwarf galaxy senstivities





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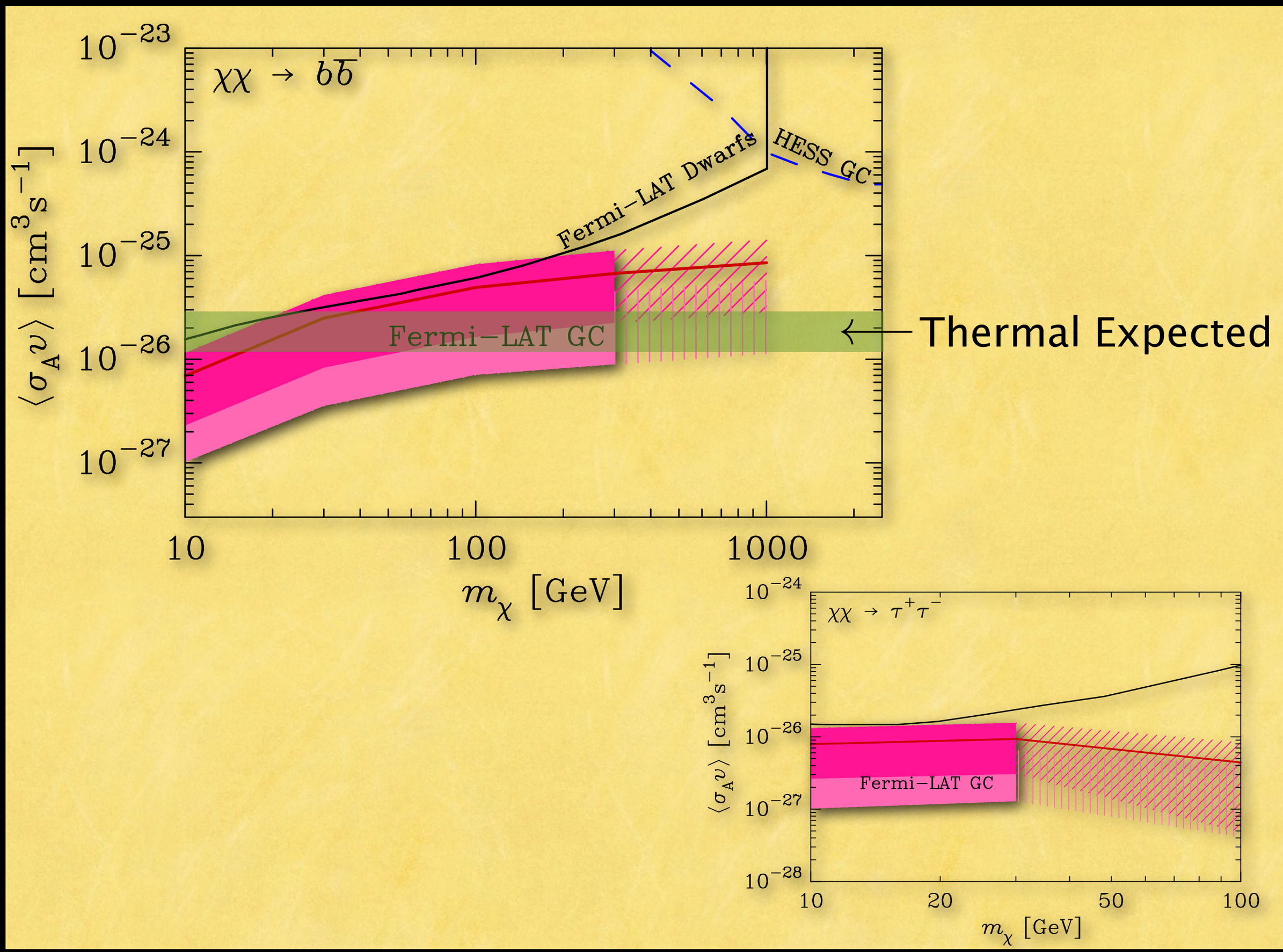

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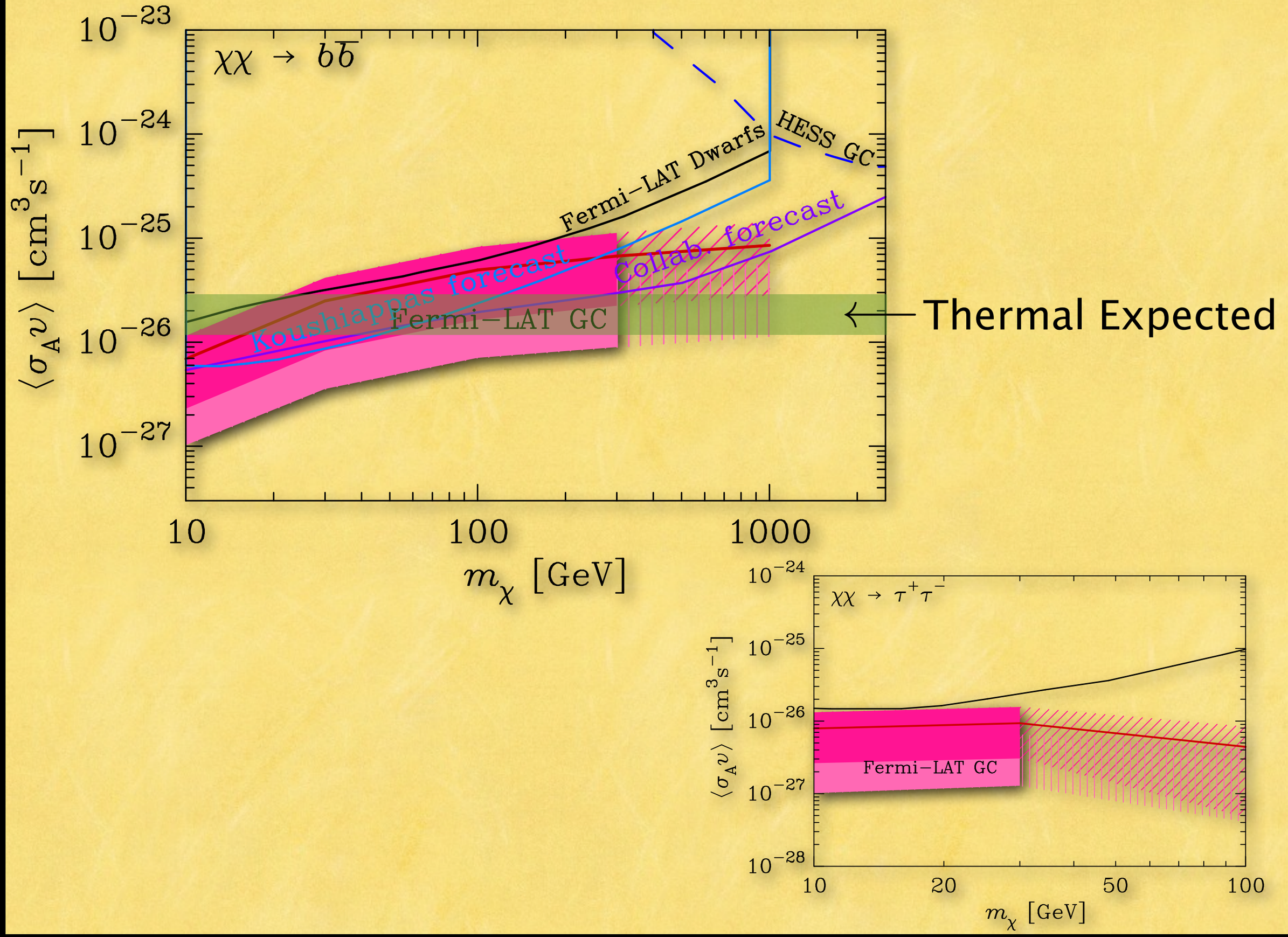

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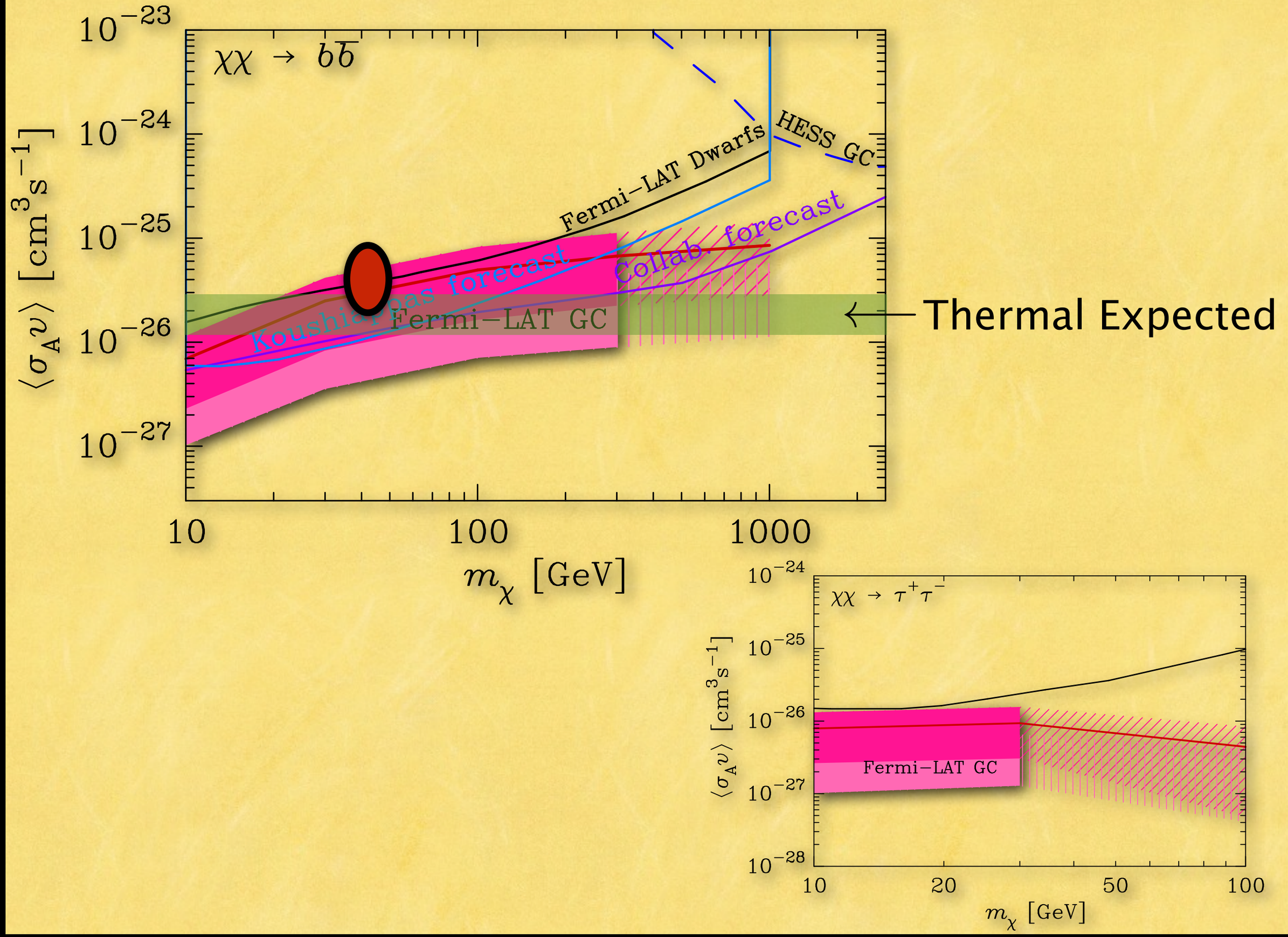

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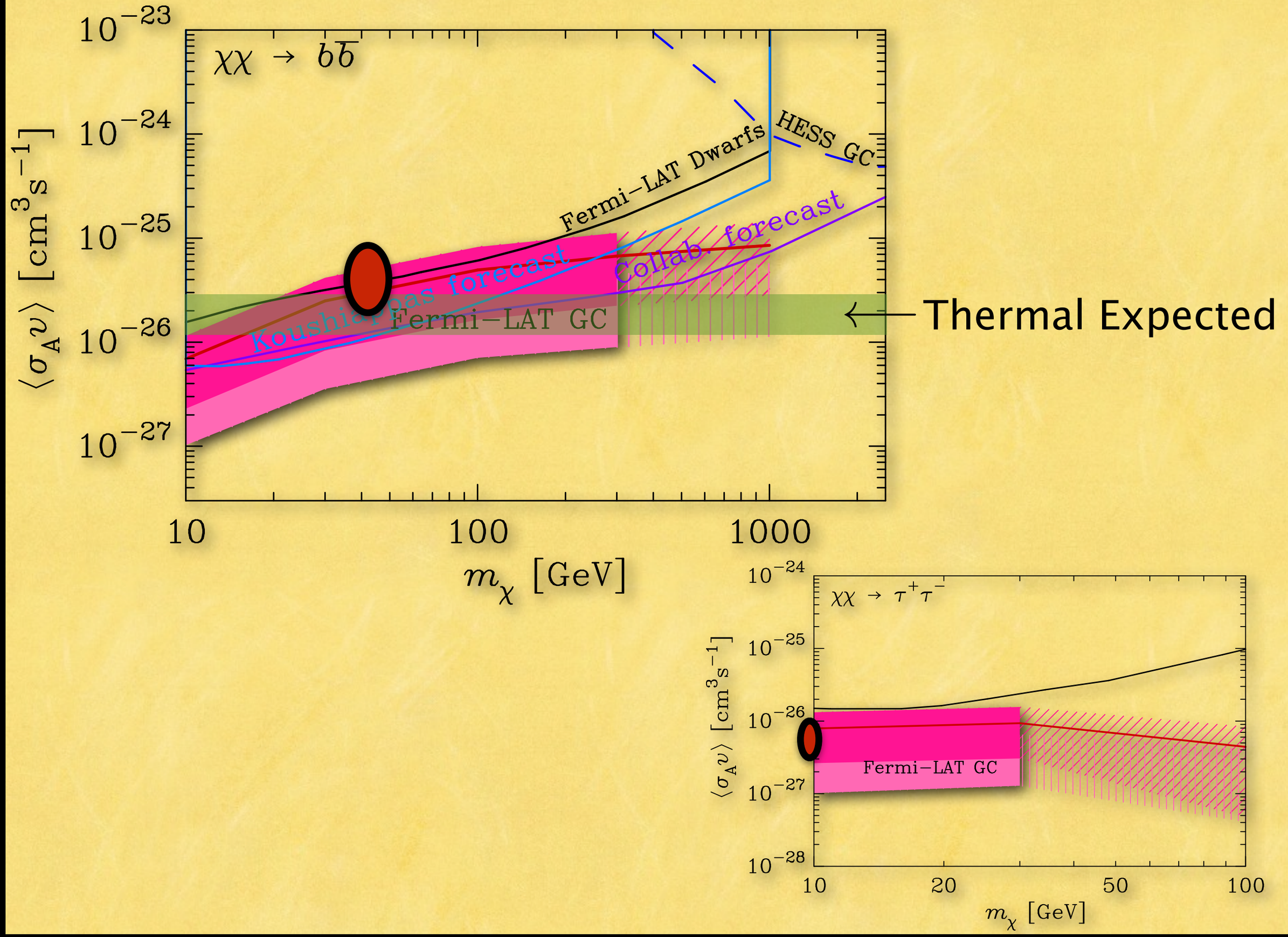

Future Space-Based Indirect Detection?

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Effective area,
effective area,
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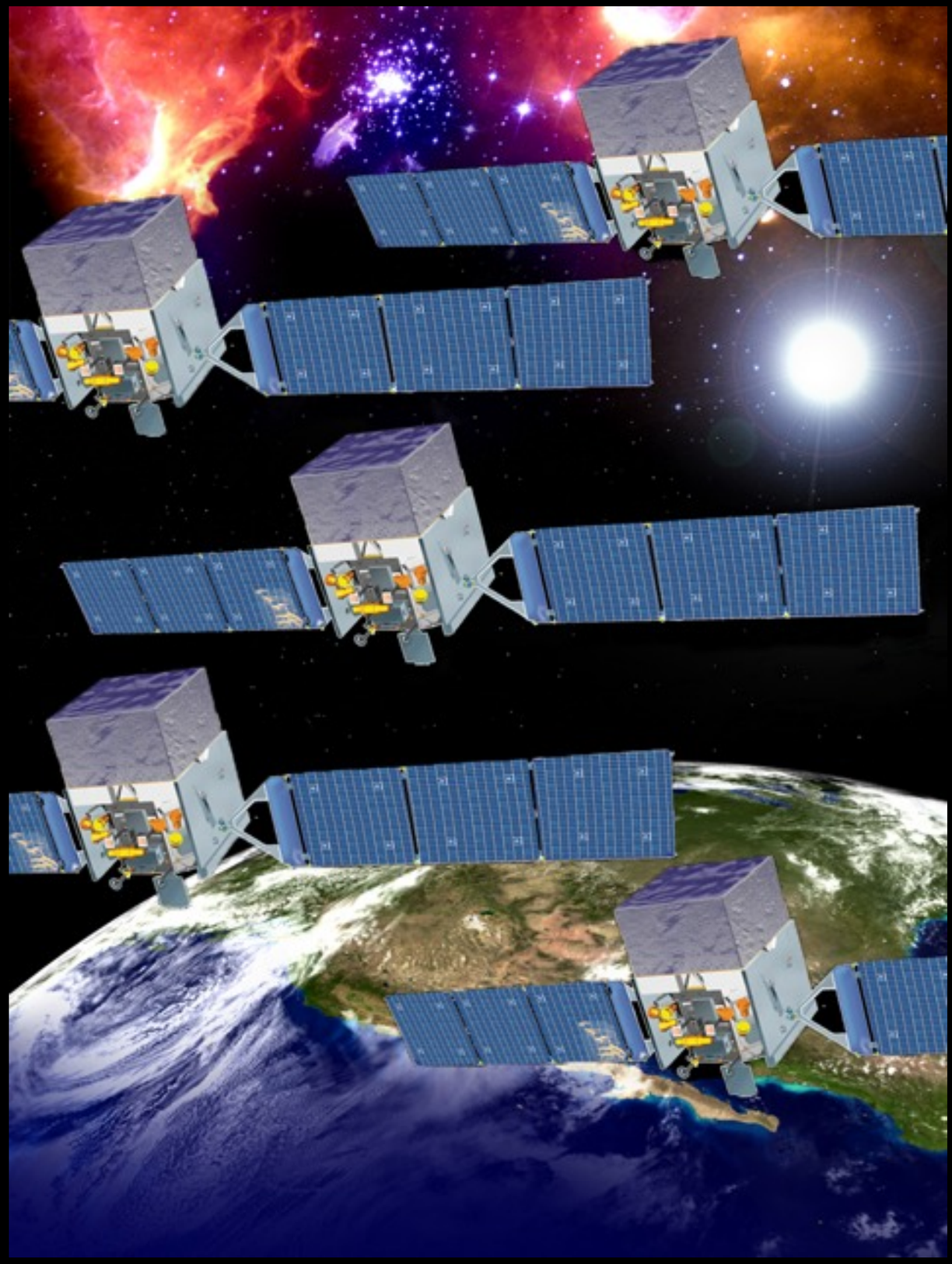

Future Space-Based Indirect Detection?

Constellation γ!

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