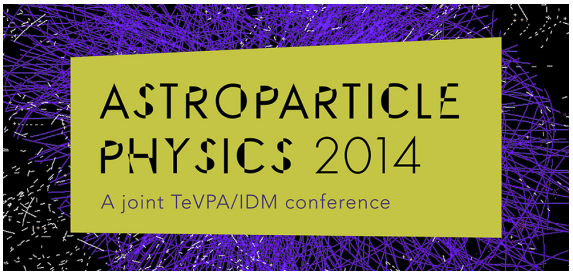

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Fitting the Fermi-LAT GeV excess: on the importance of the propagation of electrons from dark matter

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An excess of gamma rays at GeV energies has been detected in the Fermi-LAT data. This signal comes from a narrow region around the Galactic Center and has been interpreted as possible evidence for light (10-30 GeV) dark matter particles annihilating either into a mixture of leptons-antileptons and $b\bar{b}$ or into $b\bar{b}$ only. Focussing on the prompt gamma-ray emission, previous work found that the best fit to the data corresponds to annihilations proceeding predominantly into $b\bar{b}$, with a dark matter profile $\propto r^{-1.2}$.

In this talk, I will show that it is essential to take into account the diffuse gamma-ray emission (due to inverse Compton scattering and bremsstrahlung) from electrons produced in dark matter annihilations and undergoing diffusion through the Galactic magnetic field. I will first describe the technique I used to solve the transport equation of electrons in the context of a cuspy dark matter profile. Then I will present the different contributions to the gamma-ray spectrum at GeV energies. More specifically, I will show how including the additional contributions of inverse Compton and bremsstrahlung from electrons after diffusion modifies the spectrum, in particular when the final state corresponds to a combination of leptonic annihilations containing the e^+e^- and $\mu^+\mu^-$ channels.

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