

## ERRATUM: “SEARCH FOR DARK MATTER ANNIHILATION SIGNALS FROM THE FORNAX GALAXY CLUSTER WITH H.E.S.S.” (2012, ApJ, 750, 123)

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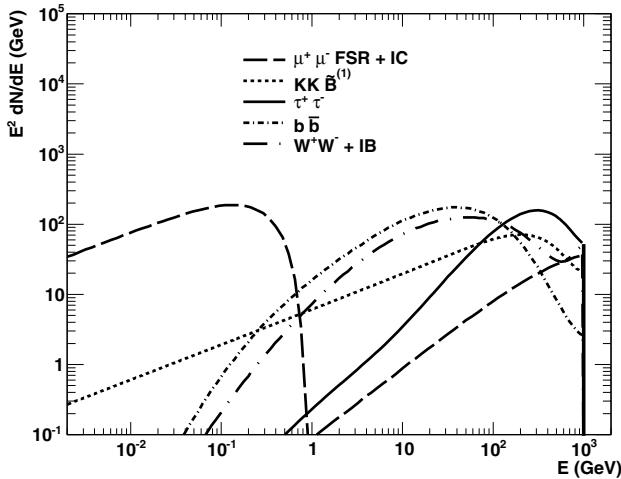
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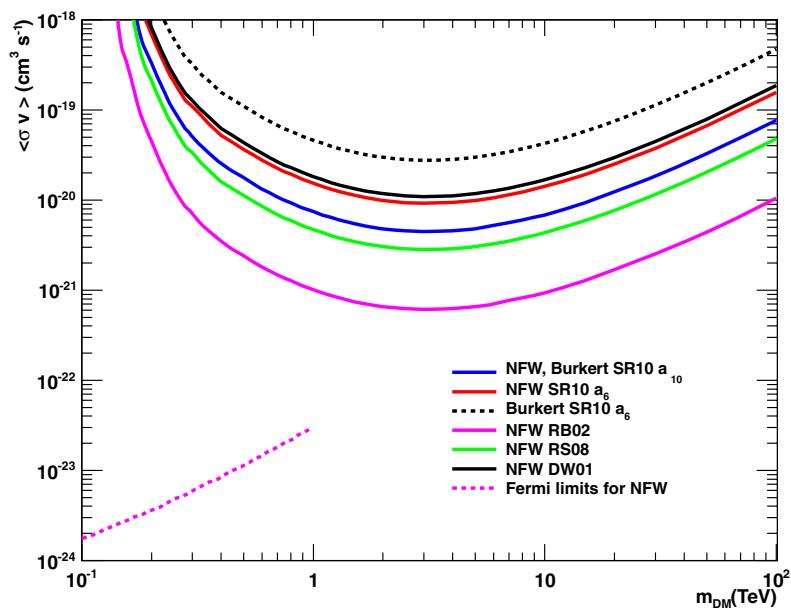
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In the article by Abramowski et al. (2012), H.E.S.S. observations of the Fornax galaxy cluster were used to produce exclusion limits on a dark matter (DM) annihilation  $\gamma$ -ray signal. Upper limits on the velocity-weighted annihilation cross section ( $\sigma v$ ) as a function of the DM particle mass were computed. Constraints were derived for different DM particle models, such as those arising from supersymmetric models, and various annihilation final states were considered. Here we report on three independent problems identified with some of the figures and DM annihilation spectra used in that article.

1. Due to a different notation used in the paper by Cirelli et al. (2011) and the accompanying code to produce DM annihilation spectra, the spectra of DM particles annihilating into  $b\bar{b}$ ,  $W^+W^-$  and  $\tau^+\tau^-$  pairs used in Abramowski et al. (2012) were shifted by a factor of  $\ln(10)$  to larger values. This normalization factor affected Figures 3, 5, 7, 8 and 9 of Abramowski et al. (2012), which are now presented here in Figures 1, 2, 3, 4 and 5, respectively, using the correct normalization of the spectra.



**Figure 1.** Photon spectra from the self-annihilation of  $m_{\text{DM}} = 1$  TeV dark matter particles into different channels. Spectra from DM annihilating purely into  $b\bar{b}$  (dot-dashed line),  $\tau^+\tau^-$  (black solid line), and  $W^+W^-$  (long-dashed-dotted line) are shown. The latter shows the effect of Internal Bremsstrahlung (IB) occurring for the  $W^+W^-$  channel. The  $\gamma$ -ray spectrum from the annihilation of  $\tilde{B}^{(1)}$  hypergauge boson pairs arising in Kaluza-Klein (KK) models with UED is also plotted (dotted line). The long dashed line show the photon spectra from final-state radiation (FSR) and the inverse Compton (IC) scattering contribution in the case of DM particles annihilating into muon pairs.



**Figure 2.** Upper limit at 95% C.L. on the velocity-weighted annihilation cross section ( $\langle \sigma v \rangle$ ) as a function of the DM particle mass, considering DM particles annihilating purely into  $b\bar{b}$  pairs. The limits are given for an integration angle  $\theta_{\text{max}} = 0^\circ.1$ . Various DM halo profiles are considered: NFW profiles, SR10  $a_{10}$  (blue solid line), DW01 (black solid line), RB02 (pink solid line), and RS08 (green solid line), and Burkert profiles, SR10  $a_6$  (red dotted line), and  $a_{10}$  (blue solid line). The *Fermi*-LAT upper limits (Ackermann et al. 2010) for the NFW profile RB02 are also plotted. See Abramowski et al. (2012) for more details.

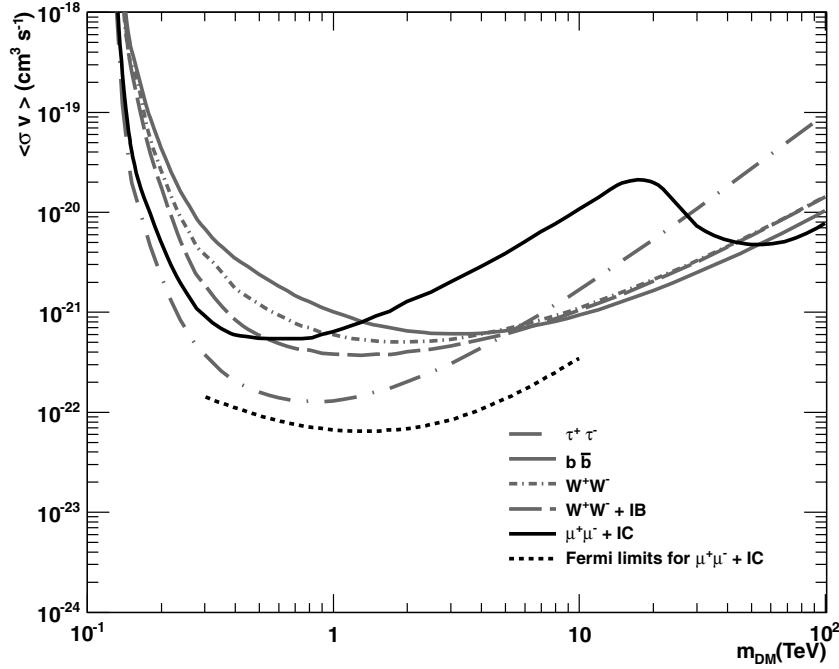
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<sup>33</sup> Supported by CAPES Foundation, Ministry of Education of Brazil.

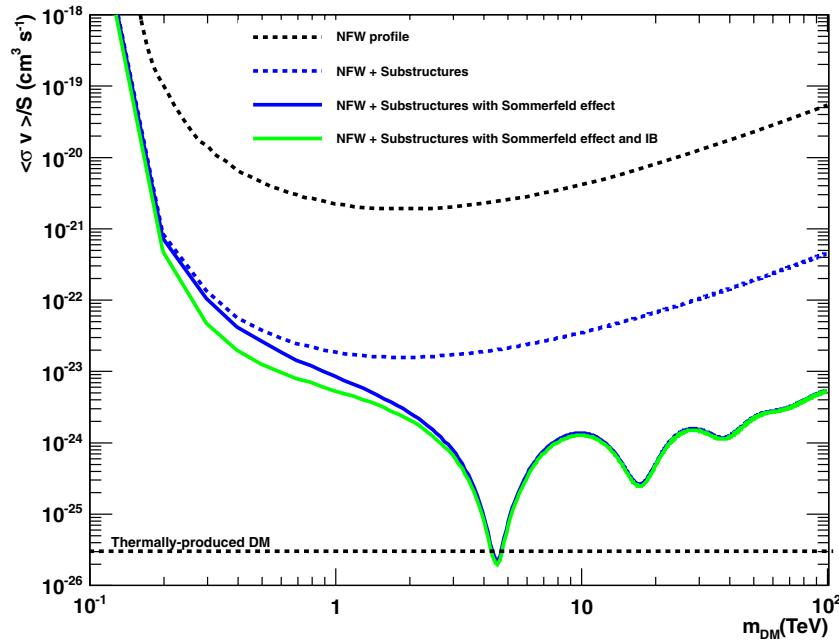
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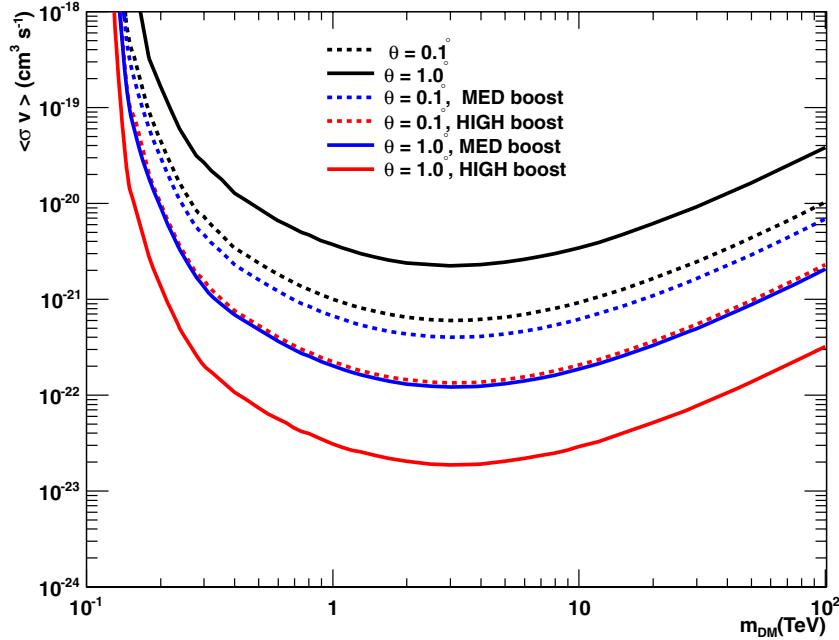
**Figure 3.** Effect of different DM particle models: Upper limit at 95% C.L. on  $\langle\sigma v\rangle$  as function of the DM particle mass. The limits are given for  $\theta_{\max} = 0.1$  and the NFW profile RB02. The limits are shown for DM particles annihilating into  $b\bar{b}$  (gray solid line),  $W^+W^-$  (gray dash-dotted line),  $\tau^+\tau^-$  (gray long-dash-dotted line) pairs. The effect of Internal Bremsstrahlung (IB) occurring for the  $W^+W^-$  channel is plotted in gray long-dashed line. The black solid line shows the limits for DM annihilating into  $\mu^+\mu^-$  pairs including the effect of inverse Compton (IC) scattering. The *Fermi*-LAT upper limits (Ackermann et al. 2010) for the NFW profile RB02 and for an DM annihilating into  $\mu^+\mu^-$  pairs including the effect of IC scattering are also plotted (black dotted line). See Abramowski et al. (2012) for more details.



**Figure 4.** Sommerfeld effect: Upper limits at 95% C.L. on the effective annihilation cross section  $\langle\sigma v\rangle_{\text{eff}} = \langle\sigma v\rangle_0 / S$  as a function of the DM particle mass annihilating into  $W$  pairs. The black line denotes the cross section limit for  $\theta_{\max} = 1.0$  without  $\gamma$ -ray flux enhancement, the dashed blue line shows the effect of halo substructure (using the “high boost,” cf. Figure 5). The solid green and blue lines show the limit for the case of Wino dark matter annihilation enhanced by the Sommerfeld effect, with and without including Internal Bremsstrahlung, respectively. The DM halo model RB02 is used. A typical value of the annihilation cross section for thermally produced DM,  $\langle\sigma v\rangle_{\text{eff}} = 3 \times 10^{-26} \text{ cm}^3 \text{s}^{-1}$ , is also plotted. See Abramowski et al. (2012) for more details.

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2. One of the exclusion curves on  $\langle\sigma v\rangle$  in Figure 5 from Abramowski et al. (2012) is not fully consistent with the model assumptions. The exclusion limit derived with the assumption of the “RB02 NFW” DM halo profile of the Fornax galaxy cluster (pink solid line) was calculated for a DM particle annihilating into  $W^+W^-$  pairs, instead of  $b\bar{b}$  pairs as reported in the captions. The correct exclusion limit for an annihilation into  $b\bar{b}$  pairs is presented here in Figure 2. The exclusion curves for the other DM halo profiles of Fornax are not affected by this correction.



**Figure 5.** Effect of DM halo substructures: Upper limit at 95% C.L. on  $\langle\sigma v\rangle$  as function of the DM particle mass annihilating purely into  $b\bar{b}$  pairs. The limits are given for  $\theta_{\max} = 0^\circ$  (dashed lines) and  $\theta_{\max} = 1^\circ$  (solid lines). The DM halo model RB02 is used. In addition, the effect of halo substructures on the  $\langle\sigma v\rangle$  limits is plotted. The “medium boost” (MED) with  $M_{\text{lim}} = 5 \times 10^{-3} M_\odot$  (blue lines) and the “high boost” (HIGH) with  $M_{\text{lim}} = 10^{-6} M_\odot$  (red lines) are considered. See Abramowski et al. (2012) for more details.

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3. In Figure 7 of Abramowski et al. (2012), a normalization factor of  $\sim 2.0$  was wrongly propagated into the astrophysical factor  $\bar{J}$  of the RB02 NFW profile, so that all the H.E.S.S. exclusion limits in this figure were shifted to lower values by the same factor. The correct exclusion limits are presented here in Figure 3. All the other results and the main conclusions of the paper remain unchanged.

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