ERRATUM: "Inverse Compton scattering on solar photons, heliospheric modulation, and neutrino astrophysics" (ApJ, 652, L65 [2006])

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We noticed an error in the description of the distribution of solar photons at an arbitrary distance from the Sun, equations (3) and (4). The correct expression is

$$Q_\nu(r, \phi) = \frac{1}{2\pi} \left[1 - \left(1 - \frac{R_\odot^2}{r^2} \right)^{1/2} \right]^{-1}, \tag{1}$$

$$\left(1 - \frac{R_\odot^2}{r^2} \right)^{1/2} \leq \cos\phi \leq 1, \tag{2}$$

i.e. $Q_\nu(r, \phi)$ is independent of ϕ within the solid angle covered by the Sun. Applying the correct angular distribution does not give results that are noticeably different from those obtained with the delta-function (pure radial) photon distribution. Indeed, it should be the case since in the energy range under consideration $\gamma_e \gg 1$ and the ambient photon angular distribution can be approximated by the delta-function.

We also discovered a numerical error in the code which affects the results below ~ 1 GeV, especially in case of small θ. Figures 3 and 4 show the corrected integral and differential intensities. Table 1 shows the corrected all-sky average integral intensities. The 68%

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containment radius of the EGRET point spread function is $\sim 6°$ at 100 MeV. For $\theta < 6°$, the corrected integral flux is $F_\gamma(> 100 \text{ MeV}) \sim (2.0 - 4.3) \times 10^{-7} \text{ cm}^{-2} \text{ s}^{-1}$, where the given range corresponds to different modulation levels ($\Phi_0 = 500 - 1000$ MV).

REFERENCES

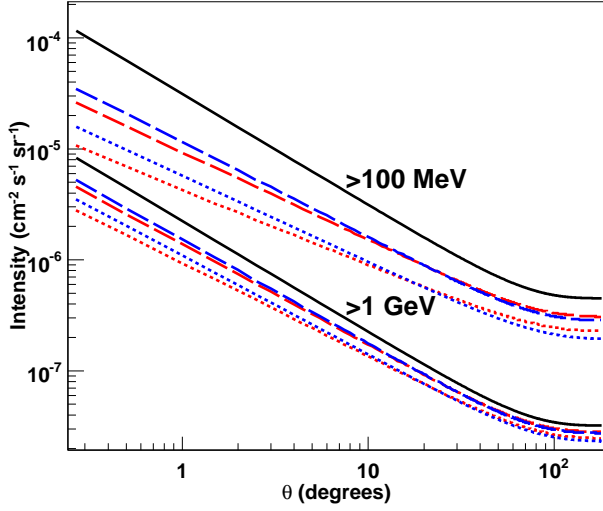Strong, A. W., Moskalenko, I. V., & Reimer, O., 2004, ApJ, 613, 956

Fig. 3.— Integral intensity above 100 MeV and 1 GeV. *Black line,* no modulation; *red lines,* potential Φ_1; *blue lines,* potential Φ_2. *Dashed lines,* $\Phi_0 = 500$ MV; *dotted lines,* $\Phi_0 = 1000$ MV.
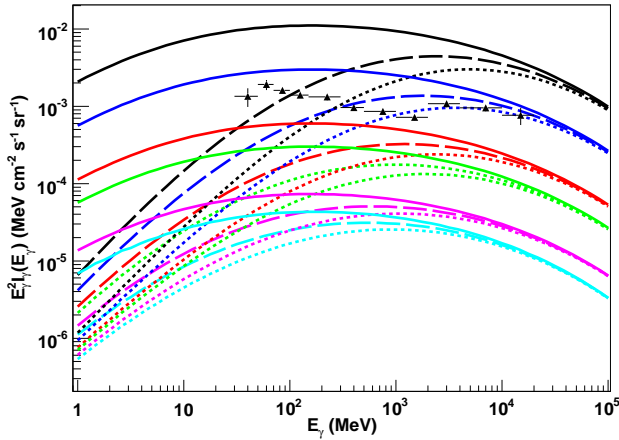

Fig. 4.— Differential intensities for selected θ. Line-sets (top to bottom): 0.3°, 1°, 5°, 10°, 45°, and 180°. Solid line: no modulation; dashed line: $\Phi_0 = 500$ MV; dotted line: $\Phi_0 = 1000$ MV. Data points: diffuse extragalactic γ-ray flux (Strong at al. 2004).

Table 1.   All-sky average integral intensity

E	$\Phi_0 = 0$	500 MV	1000 MV
>10 MeV	7.1	6.5	6.0
>100 MeV	1.3	1.2	1.1
>1 GeV	0.14	0.13	0.11

Note. — Units 10^{-6} cm^{-2} s^{-1} sr^{-1}.