

Non-parametric determination of H and He interstellar fluxes from cosmic-ray data (Corrigendum)

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Ghelfi et al. (2016) performed a global analysis of top-of-atmosphere data (with the recent PAMELA, BESS, and AMS-02 data) to obtain H and He interstellar (IS) fluxes and their uncertainties. A simple parametric formula was provided for the IS fluxes (shown in their Fig. 5) because they are of interest for a wide range of astrophysics problems. However, the parametric form of Eq. (8) contains an error and all coefficients c_{12} and ζ_0 in Table 3 are incorrect.

The new Eq. (1) and Table 1 below replace Eq. (8) and Table 3 of Ghelfi et al. (2016):

$$\log_{10}(J_{\text{IS}}) = \begin{cases} \sum_{i=0}^{14} c_i \times \left(\frac{\log_{10}(E_{k/n})}{\log_{10}(800)} \right)^i & \text{if } E_{k/n} < 800 \text{ GeV/n} \\ \zeta_0 - \zeta_1 \log_{10} \left(\frac{E_{k/n}}{800} \right) & \text{otherwise.} \end{cases} \quad (1)$$

As discussed in Ghelfi et al. (2016), the first five columns of Table 1 are coefficients for the median and 1- and 2 σ credible intervals from the Markov chain Monte Carlo (MCMC) analysis (without Voyager data), to be considered as a high estimate of the H and He IS fluxes (not valid below 400 MeV/n). The last column provides the best-fit including Voyager data (assumed interstellar), to be considered as a low estimate of the IS H and He fluxes.

References

Ghelfi, A., Barao, F., Derome, L., & Maurin, D. 2016, *A&A*, 591, A94

Table 1. Coefficients for H (*top*) and He (*bottom*) IS fluxes as parametrised by Eq. (1).

CR	Coeff.	MCMC analysis (without Voyager data)					With Voyager
		$J_{\text{IS}}^{\text{median}}$	$J_{\text{IS}}^{+1\sigma}$	$J_{\text{IS}}^{+2\sigma}$	$J_{\text{IS}}^{-1\sigma}$	$J_{\text{IS}}^{-2\sigma}$	$J_{\text{IS}}^{\text{best-fit}}$
H	c_0	+3.606565e+00	+3.641331e+00	+3.675238e+00	+3.579239e+00	+3.558852e+00	+3.461750e+00
	c_1	-5.082805e+00	-5.188158e+00	-5.301432e+00	-4.990365e+00	-4.923882e+00	-4.131050e+00
	c_2	-3.042630e+00	-3.063315e+00	-3.108698e+00	-3.015399e+00	-3.005982e+00	-4.640890e+00
	c_3	-2.501190e+00	-2.533290e+00	-2.415014e+00	-2.651540e+00	-2.718846e+00	-1.407410e+00
	c_4	+1.827880e+00	+2.259173e+00	+3.165546e+00	+1.245784e+00	+9.021010e-01	-4.750880e+00
	c_5	+1.398976e+00	+3.665969e+00	+4.651425e+00	+1.235023e+00	+7.461355e-01	+8.519700e+00
	c_6	-7.028454e-01	-1.988794e+00	-6.335426e+00	+1.403717e+00	+2.846516e+00	+3.262630e+01
	c_7	+1.997827e+01	+6.702400e+00	-1.019829e-01	+2.308918e+01	+2.675182e+01	-2.842170e+01
	c_8	+2.885280e+00	+5.931721e+00	+1.777127e+01	-6.236392e-01	-4.051921e+00	-5.817510e+01
	c_9	-7.560171e+01	-3.970706e+01	-2.281064e+01	-8.679024e+01	-9.706238e+01	+4.818490e+01
	c_{10}	+3.405332e+00	-6.448701e+00	-2.610425e+01	+7.751296e+00	+1.368927e+01	+3.390470e+01
	c_{11}	+1.168359e+02	+6.873055e+01	+4.986400e+01	+1.352808e+02	+1.491565e+02	-2.961540e+01
	c_{12}	-3.274338e+01	-1.267115e+01	+5.632782e+00	-4.007271e+01	-4.766696e+01	+5.891620e-01
	c_{13}	-6.947553e+01	-4.359515e+01	-3.576695e+01	-8.138712e+01	-8.895730e+01	-1.720810e-03
	c_{14}	+3.535965e+01	+2.042094e+01	+1.334882e+01	+4.208414e+01	+4.686525e+01	+4.974770e-04
ζ_0	-3.850699e+00	-3.842528e+00	-3.835460e+00	-3.860774e+00	-3.869752e+00	-3.857080e+00	
ζ_1	+2.703917e+00	+2.673559e+00	+2.641281e+00	+2.735238e+00	+2.771669e+00	+2.699470e+00	
He	c_0	+2.376233e+00	+2.397802e+00	+2.417316e+00	+2.360034e+00	+2.347491e+00	+2.278366e+00
	c_1	-5.306384e+00	-5.401580e+00	-5.500374e+00	-5.228385e+00	-5.175142e+00	-4.572648e+00
	c_2	-3.119940e+00	-3.078195e+00	-3.001823e+00	-3.164403e+00	-3.205423e+00	-4.865560e+00
	c_3	-2.281441e+00	-2.069706e+00	-1.669039e+00	-2.543925e+00	-2.541109e+00	+3.945156e-01
	c_4	+4.055121e+00	+4.596062e+00	+4.761539e+00	+3.677610e+00	+3.389685e+00	-1.154262e+00
	c_5	+7.473942e+00	+6.755338e+00	+4.418992e+00	+8.900246e+00	+8.076114e+00	+4.998593e+00
	c_6	-8.053260e+00	-1.214899e+01	-1.493652e+01	-4.645640e+00	-1.851096e+00	+1.649534e+01
	c_7	-1.916564e+01	-1.690602e+01	-7.277537e+00	-2.498267e+01	-2.056866e+01	-2.055111e+01
	c_8	+1.766888e+01	+3.081099e+01	+4.191729e+01	+5.834645e+00	-4.944727e+00	-2.832667e+01
	c_9	+3.293412e+01	+2.603903e+01	-7.175462e-01	+4.954050e+01	+4.025821e+01	+3.189124e+01
	c_{10}	-2.955671e+01	-4.945468e+01	-6.548408e+01	-1.202743e+01	+8.568161e+00	+1.494921e+01
	c_{11}	-3.064750e+01	-1.774034e+01	+2.470862e+01	-5.789812e+01	-5.064981e+01	-1.710165e+01
	c_{12}	+2.792617e+01	+3.906444e+01	+3.998901e+01	+2.195329e+01	+4.066492e+00	+5.813712e-01
	c_{13}	+1.090915e+01	+1.442377e+00	-2.633991e+01	+2.927813e+01	+2.875103e+01	-3.000221e-03
	c_{14}	-1.019233e+01	-9.274669e+00	+1.759650e+00	-1.604798e+01	-1.152839e+01	+1.245293e-03
ζ_0	-4.978057e+00	-4.965601e+00	-4.951528e+00	-4.992936e+00	-5.006222e+00	-4.984982e+00	
ζ_1	+2.713877e+00	+2.690776e+00	+2.664965e+00	+2.744567e+00	+2.769112e+00	+2.709368e+00	