Erratum: Multiyear search for a diffuse flux of muon neutrinos with AMANDA-II [Phys. Rev. D 76, 042008 (2007)]

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A search for TeV-PeV muon neutrinos with AMANDA-II data collected between 2000 and 2003 established an upper limit of $E^2\Phi_{90\%\text{C.L.}} < 7.4 \times 10^{-8}\ \text{GeV}\,\text{cm}^{-2}\,\text{s}^{-1}\,\text{sr}^{-1}$ on the diffuse flux of extraterrestrial muon neutrinos with a $\Phi \propto E^{-2}$ spectrum between 16 TeV and 2.5 PeV. The upper limit calculation correctly included event simulations and remains as stated. However, the calculation of the detector's efficiency, which is based only on simulations, was incorrectly tabulated in an appendix and shown in a figure. The values were approximately a factor of 10 too high, although the exact error varies in each bin. The correction has been applied in Tables I and II and Fig. 1. The effective area is the equivalent area over which the detector would be 100% efficient for detecting neutrinos. The typical uncertainty on the effective area from simulation statistics is lowest between 10^5 GeV and 10^6 GeV (2%). The uncertainty increases to 6% at 10^4 GeV and 5% around 10^7 GeV. In the remainder of this document, the number of optical modules (OMs) triggered during an event is referred to as N_{ch} and $\cos(\theta_{\text{t}})$ refers to the cosine of the simulated (true) zenith angle of an event. The term angle-averaged indicates that results are averaged over θ_{t} between 100° and 180°. All other results reported in the paper, including the upper limit, remain unchanged.

TABLE I. Effective area as a function of the energy and zenith angle of the simulation for events in the final sample satisfying $N_{ch} \geq 100$.

Energy	$-1.0 < \cos(\theta_t) < -0.8$		$-0.8 < \cos(\theta_t) < -0.6$	
$\log_{10}$ (E/GeV)	ν_μ [10^3 cm^2]	$\bar{\nu}_\mu$ [10^3 cm^2]	ν_μ [10^3 cm^2]	$\bar{\nu}_\mu$ [10^3 cm^2]
3.6	0.046	0.017	0.024	0.0084
3.8	0.094	0.1	0.052	0.049
4	0.32	0.29	0.19	0.18
4.2	0.81	0.74	0.48	0.52
4.4	1.7	1.5	1.4	1.1
4.6	2.6	2.7	2.9	2.5
4.8	4	4	4.8	5.2
5	5.3	5.7	8.2	7.6
5.2	6.5	6.2	11	11
5.4	6.4	7.4	14	14
5.6	5.6	6.4	16	16
5.8	5.2	6	16	16
6	4.3	4.3	15	15
6.2	3.3	3.3	13	13
6.4	2.4	2	9.4	9.7
6.6	0.91	1.2	6.5	6.6
6.8	0.71	0.66	4.3	4.2
7	0.37	0.28	2.6	2.7
7.2	0.26	0.15	1.5	1.5
7.4	0.078	0.07	0.83	0.87
7.6	0.074	0.047	0.45	0.49
7.8	0.02	0.055	0.26	0.19

Energy	$-0.6 < \cos(\theta_t) < -0.4$		$-0.4 < \cos(\theta_t) < -0.17$	
$\log_{10}$ (E/GeV)	ν_μ [10^3 cm^2]	$\bar{\nu}_\mu$ [10^3 cm^2]	ν_μ [10^3 cm^2]	$\bar{\nu}_\mu$ [10^3 cm^2]
3.6	0.0087	0.0043	0.0055	0.0032
3.8	0.035	0.018	0.015	0.01
4	0.081	0.087	0.11	0.037
4.2	0.35	0.31	0.16	0.14
4.4	0.9	0.8	0.69	0.59
4.6	1.9	1.9	1.5	1.6
4.8	4.4	4.1	3	3.2
5	7.5	7.1	6.8	5.8
5.2	11	11	11	10
5.4	16	14	15	14
5.6	20	19	23	20
5.8	22	20	26	27
6	23	24	32	32
6.2	24	23	37	33
6.4	22	20	38	38
6.6	18	17	37	34
6.8	13	13	36	37
7	9.4	9.8	34	31
7.2	6.9	5.9	27	29
7.4	4	3.4	23	23
7.6	2.7	1.7	16	18
7.8	1.1	1.1	12	13

TABLE II. The angle-averaged neutrino effective area as a function of energy for events in the final sample satisfying $N_{ch} \geq 100$.

Energy $\log_{10}$ (E/GeV)	Angle-averaged ν_μ [10^3 cm^2]	Angle-averaged $\bar{\nu}_\mu$ [10^3 cm^2]
3.6	0.02	0.0081
3.8	0.048	0.044
4	0.17	0.14
4.2	0.44	0.42
4.4	1.1	0.99
4.6	2.2	2.1
4.8	4	4.1
5	6.9	6.5
5.2	9.7	9.5
5.4	13	13
5.6	16	15
5.8	18	18
6	19	19
6.2	20	19
6.4	19	18
6.6	16	16
6.8	14	15
7	12	12
7.2	9.5	9.9
7.4	7.5	7.3
7.6	5.3	5.6
7.8	3.5	3.9

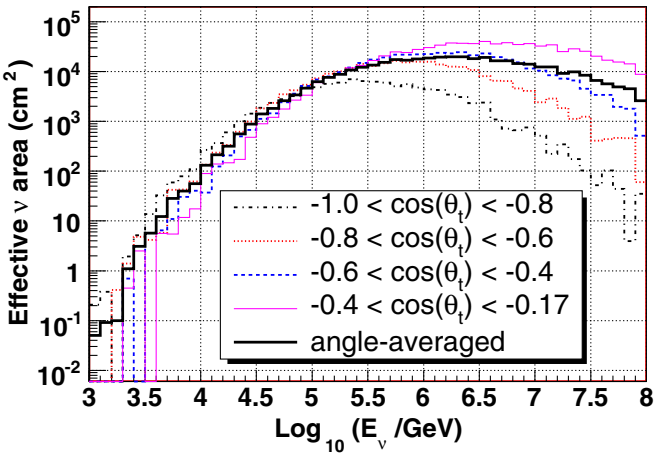

FIG. 1 (color online). Effective area for ν_μ as a function of the true simulated energy at the Earth's surface in intervals of the cosine of the true zenith angle, θ_t. The angle-averaged effective area is represented by the solid black line. This calculation was based on the final event sample for events satisfying $N_{ch} \geq 100$.