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

A. Achterberg, M. Ackermann, J. Adams, J. Ahrens, K. Andeen, J. Auffenberg, X. Bai, B. Baret, S. W. Barwick, R. Bay, K. Beattie, T. Becka, J. K. Becker, K.-H. Becker, P. Berghaus, D. Berley, E. Bernardini, D. Bertrand, D. Z. Besson, E. Blaufuss, D. J. Boersma, C. Bohm, J. Bolmont, S. Böser, O. Botner, A. Bouchta, J. Braun, T. Burgess, T. Castermans, D. Chirkin, B. Christy, J. Clem, D. F. Cowen, M. V. D'Agostino, A. Davour, C. T. Day, C. De Clercq, L. Demirörs, F. Descamps, P. Desiati, T. DeYoung, J. C. Diaz-Velez, J. Dreyer, J. P. Dumm, M. R. Duvoort, W. R. Edwards, R. Ehrlich, J. Eisch, R. W. Ellsworth, P. A. Evenson, O. Fadiran, A. R. Fazely, K. Filimonov, C. Finley, M. M. Foerster, B. D. Fox, A. Franckowiak, R. Franke, T. K. Gaisser, J. Gallagher, R. Ganugapati, H. Geenen, L. Gerhardt, A. Goldschmidt, J. A. Goodman, R. Gozzini, T. Griesel, A. Groß, S. Grullon, R. M. Gunasingha, M. Gurtner, C. Ha, A. Hallgren, F. Halzen, K. Han, K. Hanson, D. Hardtke, R. Hardtke, J. E. Hart, Y. Hasegawa, T. Hauschildt, D. Hays, J. Heise, K. Helbing, M. Hellwig, P. Herquet, G. C. Hill, J. Hodges, K. D. Hoffman, B. Hommez, K. Hoshina, D. Hubert, B. Hughey, J.-P. Hülß, P.O. Hulth, K. Hultqvist, S. Hundertmark, M. Inaba, A. Ishihara, J. Jacobsen, G. S. Japaridze, H. Johansson, A. Jones, J. M. Joseph, K.-H. Kampert, A. Kappes, T. Karg, A. Karle, H. Kawai, J. L. Kelley, F. Kislat, N. Kitamura, S. R. Klein, S. Klepser, G. Kohnen, H. Kolanoski, L. Köpke, M. Kowalski, T. Kowarik, M. Krasberg, K. Kuehn, M. Labare, H. Landsman, R. Lauer, H. Leich, D. Leier, I. Liubarsky, J. Lundberg, J. Lünemann, J. Madsen, R. Maruyama, K. Mase, H. S. Matis, T. McCauley, C. P. McParland, A. Meli, T. Messarius, P. Mészáros, H. Miyamoto, A. Mokhtarani, T. Montaruli, A. Morey, R. Morse, S. M. Movit, K. Münich, R. Nahnhauer, J. W. Nam, P. Nießen, D. R. Nygren, H. Ögelman, A. Olivas, S. Patton, C. Peña-Garay, C. Pérez de los Heros, A. Piegsa, D. Pieloth, A. C. Pohl, R. Porrata, J. Pretz, P. B. Price, G. T. Przybylski, K. Rawlins, S. Razzaque, E. Resconi, W. Rhode, M. Ribordy, A. Rizzo, S. Robbins, P. Roth, F. Rothmaier, C. Rott, D. Rutledge, D. Ryckbosch, H.-G. Sander, S. Sarkar, K. Satalecka, S. Schlenstedt, T. Schmidt, D. Schneider, D. Seckel, B. Semburg, S. H. Seo, Y. Sestayo, S. Seunarine, A. Silvestri, A. J. Smith, M. Solarz, C. Song, J. E. Sopher, G. M. Spiczak, C. Spiering, M. Stamatikos, T. Stanev, T. Stezelberger, R. G. Stokstad, M. C. Stoufer, S. Stoyanov, E. A. Strahler, T. Straszheim, K.-H. Sulanke, G. W. Sullivan, T. J. Sumner, I. Taboada, O. Tarasova, A. Tepe, L. Thollander, S. Tilav, M. Tluczykont, P. A. Toale, D. Tosi, D. Turčan, N. van Eijndhoven, J. Vandenbroucke, A. Van Overloop, V. Viscomi, B. Voigt, W. Wagner, C. Walck, H. Waldmann, M. Walter, Y.-R. Wang, C. Wendt, C. H. Wiebusch, C. Wiedemann, G. Wikström, D. R. Williams, R. Wischnewski, H. Wissing, K. Woschnagg, X. W. Xu,

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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 $E^2 \Phi_{90\% C.L.} < 7.4 \times 10^{-8}$ GeV cm⁻² s⁻¹ 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 10⁵ GeV and 10⁶ GeV (2%). The uncertainty increases to 6% at 10⁴ GeV and 5% around 10⁷ GeV. In the remainder of this document, the number of optical modules (OMs) triggered during an event is referred to as N_{ch} and $\cos(\theta_t)$ 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. ERRATA

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

Energy	-1.0 < cc	$\cos(\theta_{\rm t}) < -0.8$	-0.8 < co	$\cos(\theta_{\rm t}) < -0.6$
$\log_{10} (E/GeV)$	$\nu_{\mu} \ [10^3 \ {\rm cm}^2]$	$\bar{\nu}_{\mu} \ [10^3 \ {\rm cm}^2]$	$\nu_{\mu} \ [10^3 \ {\rm cm}^2]$	$\bar{\nu}_{\mu}$ [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	43	43	15	15
62	33	33	13	13
64	2.4	2	94	97
66	0.91	12	65	66
6.8	0.71	0.66	43	4.2
7	0.37	0.00	26	7.2
7 7 2	0.26	0.28	1.5	2.7
7.2	0.20	0.15	0.83	0.87
7.4	0.078	0.07	0.85	0.87
7.0	0.074	0.047	0.45	0.49
	0.02	0.055	0.20	0.17
			$-0.4 < \cos(\theta_{\star}) < -0.17$	
Energy	-0.6 < c	$os(\theta_t) < -0.4$	-0.4 < co	$\cos(\theta_t) < -0.17$
Energy log ₁₀ (E/GeV)	-0.6 < m c $ u_{\mu} \ [10^3 \ m cm^2]$	$ os(\theta_t) < -0.4 \bar{\nu}_{\mu} \ [10^3 \ cm^2] $	-0.4 < m correct $ u_{\mu} \ [10^3 \ m cm^2] $	$\bar{\nu}_{\mu} \ [10^3 \ \mathrm{cm}^2]$
Energy $\log_{10} (E/GeV)$ 3.6	$-0.6 < c$ $ \nu_{\mu} [10^3 \text{ cm}^2] $ 0.0087	$ os(\theta_t) < -0.4 $ $ \bar{\nu}_{\mu} \ [10^3 \ cm^2] $ 0.0043	$-0.4 < column{0}{c}$ $\nu_{\mu} \ [10^3 \ cm^2]$ 0.0055	$\frac{\bar{\nu}_{\mu} (10^3 \text{ cm}^2)}{\bar{\nu}_{\mu} [10^3 \text{ cm}^2]}$ 0.0032
Energy log_{10} (E/GeV) 3.6 3.8	$-0.6 < c$ $\nu_{\mu} [10^{3} \text{ cm}^{2}]$ 0.0087 0.035	$\frac{\cos(\theta_{t}) < -0.4}{\bar{\nu}_{\mu} \ [10^{3} \ \text{cm}^{2}]}$ 0.0043 0.018	$\begin{array}{c} -0.4 < column{0}{c} \\ \nu_{\mu} \ [10^3 \ cm^2] \\ 0.0055 \\ 0.015 \end{array}$	$\frac{\bar{\nu}_{\mu} \ [10^3 \ \mathrm{cm}^2]}{\begin{array}{c} \bar{\nu}_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ 0.0032 \\ 0.01 \end{array}}$
Energy log_{10} (E/GeV) 3.6 3.8 4	$-0.6 < c$ $\nu_{\mu} [10^{3} \text{ cm}^{2}]$ 0.0087 0.035 0.081	$ \frac{\cos(\theta_{t}) < -0.4}{\bar{\nu}_{\mu} \ [10^{3} \ \text{cm}^{2}]} \\ 0.0043 \\ 0.018 \\ 0.087 $	$ \begin{array}{r} -0.4 < column{d}column$	$\frac{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}$ $\frac{0.0032}{0.01}$ 0.037
Energy log_{10} (E/GeV) 3.6 3.8 4 4.2	$-0.6 < c$ $\nu_{\mu} [10^{3} \text{ cm}^{2}]$ 0.0087 0.035 0.081 0.35	$ \frac{\cos(\theta_{t}) < -0.4}{\bar{\nu}_{\mu} \ [10^{3} \ cm^{2}]} \\ 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 $	$\begin{array}{r} -0.4 < column{1}{c} \nu_{\mu} \ [10^3 \ cm^2] \\ \hline 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \end{array}$	$\frac{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}$ $\frac{0.0032}{0.01}$ 0.037 0.14
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4	$\begin{array}{r} -0.6 < c \\ \nu_{\mu} \ [10^3 \ cm^2] \\ 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \end{array}$	$ \frac{\cos(\theta_t) < -0.4}{\bar{\nu}_{\mu} \ [10^3 \ cm^2]} \\ 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 $	$\begin{array}{c} -0.4 < column{d} \nu_{\mu} \ [10^3 \ cm^2] \\ \hline 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \end{array}$	$\frac{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}$ $\frac{0.0032}{0.01}$ 0.037 0.14 0.59
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.6	$\begin{array}{r} -0.6 < c \\ \nu_{\mu} \ [10^3 \ cm^2] \\ 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \end{array}$	$ \frac{\cos(\theta_t) < -0.4}{\bar{\nu}_{\mu} \ [10^3 \ cm^2]} \\ 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 $	$\begin{array}{r} -0.4 < column{d} \nu_{\mu} \ [10^3 \ cm^2] \\ 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \end{array}$	$\frac{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}$ $\frac{0.0032}{0.01}$ 0.037 0.14 0.59 1.6
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8	$\begin{array}{r} -0.6 < \mathrm{c} \\ \nu_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \end{array}$	$ \frac{\cos(\theta_t) < -0.4}{\bar{\nu}_{\mu} \ [10^3 \ cm^2]} \\ 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 $	$\begin{array}{r} -0.4 < column{d} \nu_{\mu} \ [10^{3} \ cm^{2}] \\ \hline 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \end{array}$	$\frac{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}$ $\frac{0.0032}{0.01}$ 0.037 0.14 0.59 1.6 3.2
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8 5	$\begin{array}{r} -0.6 < \mathrm{c} \\ \nu_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \end{array}$	$ \frac{\cos(\theta_t) < -0.4}{\bar{\nu}_{\mu} \ [10^3 \ cm^2]} \\ \begin{array}{r} 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ \end{array} $	$\begin{array}{r} -0.4 < column{d}{c} \nu_{\mu} \ [10^3 \ cm^2] \\ \hline 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \end{array}$	$\frac{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}$ $\frac{0.0032}{0.01}$ 0.037 0.14 0.59 1.6 3.2 5.8
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.2 4.4 4.6 4.8 5 5 5.2	$\begin{array}{r} -0.6 < \mathrm{c} \\ \nu_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ \hline 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \end{array}$	$ \frac{\cos(\theta_t) < -0.4}{\bar{\nu}_{\mu} \ [10^3 \ cm^2]} \\ 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 $	$\begin{array}{r} -0.4 < column{d}{c} \nu_{\mu} \ [10^{3} \ cm^{2}] \\ \hline 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \end{array}$	$\frac{\overline{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}$ $\frac{0.0032}{0.01}$ 0.037 0.14 0.59 1.6 3.2 5.8 10
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8 5 5.2 5.2 5.4	$\begin{array}{r} -0.6 < \mathrm{c} \\ \nu_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ \hline 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \\ 16 \end{array}$	$ \frac{\cos(\theta_t) < -0.4}{\bar{\nu}_{\mu} \ [10^3 \ \text{cm}^2]} \\ 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 \\ 14 $	$\begin{array}{r} -0.4 < column{d}{c} \nu_{\mu} \ [10^3 \ cm^2] \\ \hline 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \\ 15 \end{array}$	$\frac{\overline{\nu}_{\mu} (10^{3} \text{ cm}^{2})}{\overline{\nu}_{\mu} (10^{3} \text{ cm}^{2})}$ 0.0032 0.01 0.037 0.14 0.59 1.6 3.2 5.8 10 14
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8 5 5.2 5.2 5.4 5.6	$\begin{array}{r} -0.6 < \mathrm{c} \\ \nu_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ \hline 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \\ 16 \\ 20 \end{array}$	$ \frac{\cos(\theta_t) < -0.4}{\bar{\nu}_{\mu} \ [10^3 \ cm^2]} \\ 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 \\ 14 \\ 19 $	$\begin{array}{r} -0.4 < column{2}{c} \nu_{\mu} \ [10^{3} \ cm^{2}] \\ \hline 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \\ 15 \\ 23 \end{array}$	$\frac{\overline{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}{\overline{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}$ 0.0032 0.01 0.037 0.14 0.59 1.6 3.2 5.8 10 14 20
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8 5 5.2 5.2 5.4 5.6 5.8	$\begin{array}{r} -0.6 < \mathrm{c} \\ \nu_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ \hline 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \\ 16 \\ 20 \\ 22 \end{array}$	$ \frac{\cos(\theta_t) < -0.4}{\bar{\nu}_{\mu} \ [10^3 \ cm^2]} \\ 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 \\ 14 \\ 19 \\ 20 $	$\begin{array}{r} -0.4 < column{2}{c} \nu_{\mu} \ [10^{3} \ cm^{2}] \\ \hline 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \\ 15 \\ 23 \\ 26 \end{array}$	$\frac{\overline{\nu}_{\mu} (10^{3} \text{ cm}^{2})}{\overline{\nu}_{\mu} (10^{3} \text{ cm}^{2})}$ 0.0032 0.01 0.037 0.14 0.59 1.6 3.2 5.8 10 14 20 27
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8 5 5.2 5.2 5.4 5.6 5.8 6	$\begin{array}{c} -0.6 < c \\ \nu_{\mu} \ [10^3 \ cm^2] \\ 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \\ 16 \\ 20 \\ 22 \\ 23 \end{array}$	$\begin{array}{r} \cos(\theta_{t}) < -0.4 \\ \bar{\nu}_{\mu} \ [10^{3} \ \mathrm{cm}^{2}] \\ \hline 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 \\ 14 \\ 19 \\ 20 \\ 24 \end{array}$	$\begin{array}{c} -0.4 < column{d} \nu_{\mu} \ [10^3 \ cm^2] \\ 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \\ 15 \\ 23 \\ 26 \\ 32 \end{array}$	$\frac{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}$ $\begin{array}{c} 0.0032\\0.01\\0.037\\0.14\\0.59\\1.6\\3.2\\5.8\\10\\14\\20\\27\\32\end{array}$
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8 5 5.2 5.4 5.6 5.8 6 6 6.2	$\begin{array}{c} -0.6 < c \\ \nu_{\mu} \ [10^3 \ cm^2] \\ 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \\ 16 \\ 20 \\ 22 \\ 23 \\ 24 \end{array}$	$\begin{array}{c} \cos(\theta_{t}) < -0.4 \\ \bar{\nu}_{\mu} \ [10^{3} \ \mathrm{cm}^{2}] \\ \hline 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 \\ 14 \\ 19 \\ 20 \\ 24 \\ 23 \end{array}$	$\begin{array}{c} -0.4 < column{d} \nu_{\mu} \ [10^3 \ cm^2] \\ \hline 0.0055 \\ 0.015 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \\ 15 \\ 23 \\ 26 \\ 32 \\ 37 \end{array}$	$\frac{\overline{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}{\overline{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}$ $\begin{array}{c} 0.0032\\0.01\\0.037\\0.14\\0.59\\1.6\\3.2\\5.8\\10\\14\\20\\27\\32\\33\end{array}$
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8 5 5.2 5.4 5.6 5.8 6 6 6.2 6.4	$\begin{array}{c} -0.6 < \mathrm{c} \\ \nu_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \\ 16 \\ 20 \\ 22 \\ 23 \\ 24 \\ 22 \end{array}$	$\begin{array}{c} \cos(\theta_{t}) < -0.4 \\ \bar{\nu}_{\mu} \ [10^{3} \ \mathrm{cm}^{2}] \\ \hline 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 \\ 14 \\ 19 \\ 20 \\ 24 \\ 23 \\ 20 \end{array}$	$\begin{array}{r} -0.4 < column{2}{c} \nu_{\mu} \ [10^{3} \ cm^{2}] \\ \hline 0.0055 \\ 0.015 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \\ 15 \\ 23 \\ 26 \\ 32 \\ 37 \\ 38 \end{array}$	$\frac{\overline{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}{\overline{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}$ $\begin{array}{c} 0.0032\\0.01\\0.037\\0.14\\0.59\\1.6\\3.2\\5.8\\10\\14\\20\\27\\32\\33\\38\end{array}$
Energy log_{10} (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8 5 5.2 5.4 5.6 5.8 6 6.2 6.4 6.6	$\begin{array}{c} -0.6 < c \\ \nu_{\mu} \ [10^3 \ cm^2] \\ \hline 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \\ 16 \\ 20 \\ 22 \\ 23 \\ 24 \\ 22 \\ 18 \end{array}$	$\begin{array}{r} \cos(\theta_{t}) < -0.4 \\ \bar{\nu}_{\mu} \ [10^{3} \ \mathrm{cm}^{2}] \\ \hline 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 \\ 14 \\ 19 \\ 20 \\ 24 \\ 23 \\ 20 \\ 17 \end{array}$	$\begin{array}{c} -0.4 < column{a}{c} \nu_{\mu} \ [10^3 \ cm^2] \\ \hline 0.0055 \\ 0.015 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \\ 15 \\ 23 \\ 26 \\ 32 \\ 37 \\ 38 \\ 37 \end{array}$	$\frac{\bar{p}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}{\bar{\nu}_{\mu} \left[10^{3} \text{ cm}^{2}\right]}$ $\frac{0.0032}{0.01}$ 0.037 0.14 0.59 1.6 3.2 5.8 10 14 20 27 32 33 38 34
Energy log_{10} (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8 5 5.2 5.4 5.6 5.8 6 6 6.2 6.4 6.6 6.8	$\begin{array}{c} -0.6 < \mathrm{c} \\ \nu_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ \hline 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \\ 16 \\ 20 \\ 22 \\ 23 \\ 24 \\ 22 \\ 18 \\ 13 \end{array}$	$\begin{array}{r} \cos(\theta_{t}) < -0.4 \\ \bar{\nu}_{\mu} \ [10^{3} \ \mathrm{cm}^{2}] \\ \hline 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 \\ 14 \\ 19 \\ 20 \\ 24 \\ 23 \\ 20 \\ 17 \\ 13 \end{array}$	$\begin{array}{c} -0.4 < column{a}{c} \nu_{\mu} \ [10^3 \ cm^2] \\ \hline 0.0055 \\ 0.015 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \\ 15 \\ 23 \\ 26 \\ 32 \\ 37 \\ 38 \\ 37 \\ 36 \end{array}$	$\frac{\cos(\theta_t) < -0.17}{\bar{\nu}_{\mu} \ [10^3 \ cm^2]}$ $\begin{array}{c} 0.0032 \\ 0.01 \\ 0.037 \\ 0.14 \\ 0.59 \\ 1.6 \\ 3.2 \\ 5.8 \\ 10 \\ 14 \\ 20 \\ 27 \\ 32 \\ 33 \\ 38 \\ 34 \\ 37 \end{array}$
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8 5 5.2 5.4 5.6 5.8 6 6 6.2 6.4 6.6 6.8 7	$\begin{array}{c} -0.6 < \mathrm{c} \\ \nu_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ \hline 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \\ 16 \\ 20 \\ 22 \\ 23 \\ 24 \\ 22 \\ 18 \\ 13 \\ 9.4 \end{array}$	$\begin{array}{r} \cos(\theta_{t}) < -0.4 \\ \bar{\nu}_{\mu} \ [10^{3} \ \mathrm{cm}^{2}] \\ \hline 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 \\ 14 \\ 19 \\ 20 \\ 24 \\ 23 \\ 20 \\ 17 \\ 13 \\ 9.8 \end{array}$	$\begin{array}{c} -0.4 < column{d}{c} \nu_{\mu} \ [10^3 \ cm^2] \\ \hline 0.0055 \\ 0.015 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \\ 15 \\ 23 \\ 26 \\ 32 \\ 37 \\ 38 \\ 37 \\ 36 \\ 34 \end{array}$	$\frac{\cos(\theta_t) < -0.17}{\bar{\nu}_{\mu} \ [10^3 \ cm^2]}$ $\begin{array}{r} 0.0032 \\ 0.01 \\ 0.037 \\ 0.14 \\ 0.59 \\ 1.6 \\ 3.2 \\ 5.8 \\ 10 \\ 14 \\ 20 \\ 27 \\ 32 \\ 33 \\ 38 \\ 34 \\ 37 \\ 31 \end{array}$
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.2 4.4 4.6 4.8 5 5.2 5.2 5.4 5.6 5.8 6 6 6.2 6.4 6.6 6.8 7 7.2	$\begin{array}{c} -0.6 < \mathrm{c} \\ \nu_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ \hline 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \\ 16 \\ 20 \\ 22 \\ 23 \\ 24 \\ 22 \\ 18 \\ 13 \\ 9.4 \\ 6.9 \end{array}$	$\begin{array}{r} \cos(\theta_{t}) < -0.4 \\ \bar{\nu}_{\mu} \ [10^{3} \ \mathrm{cm}^{2}] \\ \hline 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 \\ 14 \\ 19 \\ 20 \\ 24 \\ 23 \\ 20 \\ 17 \\ 13 \\ 9.8 \\ 5.9 \end{array}$	$\begin{array}{c} -0.4 < column{2}{c} \\ \nu_{\mu} \ [10^3 \ cm^2] \\ \hline 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \\ 15 \\ 23 \\ 26 \\ 32 \\ 37 \\ 38 \\ 37 \\ 38 \\ 37 \\ 36 \\ 34 \\ 27 \end{array}$	$\frac{\cos(\theta_t) < -0.17}{\bar{\nu}_{\mu} \ [10^3 \ cm^2]}$ $\begin{array}{c} 0.0032\\ 0.01\\ 0.037\\ 0.14\\ 0.59\\ 1.6\\ 3.2\\ 5.8\\ 10\\ 14\\ 20\\ 27\\ 32\\ 33\\ 38\\ 34\\ 37\\ 31\\ 29 \end{array}$
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8 5 5.2 5.4 5.6 5.8 6 6 6.2 6.4 6.6 6.8 7 7.2 7.4	$\begin{array}{c} -0.6 < \mathrm{c} \\ \nu_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ \hline 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \\ 16 \\ 20 \\ 22 \\ 23 \\ 24 \\ 22 \\ 18 \\ 13 \\ 9.4 \\ 6.9 \\ 4 \end{array}$	$\begin{array}{r} \cos(\theta_{t}) < -0.4 \\ \bar{\nu}_{\mu} \ [10^{3} \ \mathrm{cm}^{2}] \\ \hline 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 \\ 14 \\ 19 \\ 20 \\ 24 \\ 23 \\ 20 \\ 17 \\ 13 \\ 9.8 \\ 5.9 \\ 3.4 \end{array}$	$\begin{array}{c} -0.4 < column{2}{c} \nu_{\mu} \ [10^3 \ cm^2] \\ \hline 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \\ 15 \\ 23 \\ 26 \\ 32 \\ 37 \\ 38 \\ 37 \\ 38 \\ 37 \\ 36 \\ 34 \\ 27 \\ 23 \end{array}$	$\frac{\cos(\theta_t) < -0.17}{\bar{\nu}_{\mu} \ [10^3 \ cm^2]}$ $\begin{array}{c} 0.0032\\ 0.01\\ 0.037\\ 0.14\\ 0.59\\ 1.6\\ 3.2\\ 5.8\\ 10\\ 14\\ 20\\ 27\\ 32\\ 33\\ 38\\ 34\\ 37\\ 31\\ 29\\ 23\\ \end{array}$
Energy log ₁₀ (E/GeV) 3.6 3.8 4 4.2 4.4 4.6 4.8 5 5.2 5.4 5.6 5.8 6 6 6.2 6.4 6.6 6.8 7 7.2 7.4 7.6	$\begin{array}{c} -0.6 < \mathrm{c} \\ \nu_{\mu} \ [10^3 \ \mathrm{cm}^2] \\ \hline 0.0087 \\ 0.035 \\ 0.081 \\ 0.35 \\ 0.9 \\ 1.9 \\ 4.4 \\ 7.5 \\ 11 \\ 16 \\ 20 \\ 22 \\ 23 \\ 24 \\ 22 \\ 18 \\ 13 \\ 9.4 \\ 6.9 \\ 4 \\ 2.7 \end{array}$	$\begin{array}{r} \cos(\theta_{t}) < -0.4 \\ \bar{\nu}_{\mu} \ [10^{3} \ \mathrm{cm}^{2}] \\ \hline 0.0043 \\ 0.018 \\ 0.087 \\ 0.31 \\ 0.8 \\ 1.9 \\ 4.1 \\ 7.1 \\ 11 \\ 14 \\ 19 \\ 20 \\ 24 \\ 23 \\ 20 \\ 17 \\ 13 \\ 9.8 \\ 5.9 \\ 3.4 \\ 1.7 \end{array}$	$\begin{array}{c} -0.4 < column{2}{c} \\ \nu_{\mu} \ [10^3 \ cm^2] \\ \hline 0.0055 \\ 0.015 \\ 0.11 \\ 0.16 \\ 0.69 \\ 1.5 \\ 3 \\ 6.8 \\ 11 \\ 15 \\ 23 \\ 26 \\ 32 \\ 37 \\ 38 \\ 37 \\ 36 \\ 34 \\ 27 \\ 23 \\ 16 \end{array}$	$\frac{\cos(\theta_t) < -0.17}{\bar{\nu}_{\mu} \ [10^3 \ cm^2]}$ $\begin{array}{c} 0.0032\\ 0.01\\ 0.037\\ 0.14\\ 0.59\\ 1.6\\ 3.2\\ 5.8\\ 10\\ 14\\ 20\\ 27\\ 32\\ 33\\ 38\\ 34\\ 37\\ 31\\ 29\\ 23\\ 18\\ \end{array}$

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

Energy	Angle-averaged	Angle-averaged $\bar{\nu}_{\mu}$ [10 ³ cm ²]
$\log_{10} (E/GeV)$	$\nu_{\mu} \ [10^3 \ { m cm}^2]$	
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 $N_{ch} \ge 100$.