

MagEIS Calibration Factors: Ion Main Rates

June 18, 2021

Table 1 through Table 5 provide energy channel definitions and flux conversion factors for the main rate proton channels on both Probes. Note the valid time ranges indicated in the table captions.

Table 1: Energy/Flux Calibration Factors for the Proton Channels on Probe A. Valid from 06 Sep 2012 00:00:00 to 23 Dec 2012 00:00:00. Main rate LUTID: 29952. Note that channel 20 should be considered invalid (it has PHA 255 junk bin included).

| Chan # | E [keV] | $\Delta E (E_{lo}, E_{hi})$ [keV] | $\Delta E/E$ [%] | G [cm ² sr] | ϵ |
|-----------|--------------|--------------------------------------|---------------------|-----------------------------|------------|
| 0 | 64 | 5 (61,67) | 8 | 0.00236 | 1.0 |
| 1 | 75 | 5 (72,77) | 7 | 0.00236 | 1.0 |
| 2 | 88 | 11 (83,94) | 12 | 0.00236 | 1.0 |
| 3 | 105 | 11 (99,110) | 10 | 0.00236 | 1.0 |
| 4 | 121 | 11 (115,126) | 9 | 0.00236 | 1.0 |
| 5 | 140 | 16 (132,148) | 12 | 0.00236 | 1.0 |
| 6 | 164 | 22 (153,175) | 13 | 0.00236 | 1.0 |
| 7 | 191 | 22 (180,202) | 11 | 0.00236 | 1.0 |
| 8 | 224 | 33 (208,240) | 15 | 0.00236 | 1.0 |
| 9 | 256 | 22 (246,267) | 8 | 0.00236 | 1.0 |
| 10 | 294 | 43 (273,316) | 15 | 0.00236 | 1.0 |
| 11 | 346 | 49 (322,370) | 14 | 0.00236 | 1.0 |
| 12 | 403 | 54 (376,430) | 13 | 0.00236 | 1.0 |
| 13 | 468 | 65 (435,501) | 14 | 0.00236 | 1.0 |
| 14 | 544 | 76 (506,582) | 14 | 0.00236 | 1.0 |
| 15 | 631 | 87 (587,674) | 14 | 0.00236 | 1.0 |
| 16 | 734 | 108 (680,788) | 15 | 0.00236 | 1.0 |
| 17 | 853 | 119 (794,913) | 14 | 0.00236 | 1.0 |
| 18 | 994 | 152 (918,1070) | 15 | 0.00236 | 1.0 |
| 19 | 1154 | 157 (1076,1233) | 14 | 0.00236 | 1.0 |
| 20 | 1295 | 114 (1238,1352) | 9 | 0.00236 | 1.0 |

Table 2: Energy/Flux Calibration Factors for the Proton Channels on Probe A. Valid from 23 Dec 2012 00:00:00 to 31 Mar 2013 00:00:00. Main rate LUTID: 29953.

| Chan # | E [keV] | $\Delta E (E_{lo}, E_{hi})$ [keV] | $\Delta E/E$ [%] | G [cm ² sr] | ϵ |
|--------|-----------|-----------------------------------|------------------|--------------------------|------------|
| 0 | 64 | 5 (61,67) | 8 | 0.00236 | 1.0 |
| 1 | 75 | 5 (72,77) | 7 | 0.00236 | 1.0 |
| 2 | 88 | 11 (83,94) | 12 | 0.00236 | 1.0 |
| 3 | 105 | 11 (99,110) | 10 | 0.00236 | 1.0 |
| 4 | 121 | 11 (115,126) | 9 | 0.00236 | 1.0 |
| 5 | 140 | 16 (132,148) | 12 | 0.00236 | 1.0 |
| 6 | 164 | 22 (153,175) | 13 | 0.00236 | 1.0 |
| 7 | 191 | 22 (180,202) | 11 | 0.00236 | 1.0 |
| 8 | 224 | 33 (208,240) | 15 | 0.00236 | 1.0 |
| 9 | 256 | 22 (246,267) | 8 | 0.00236 | 1.0 |
| 10 | 294 | 43 (273,316) | 15 | 0.00236 | 1.0 |
| 11 | 346 | 49 (322,370) | 14 | 0.00236 | 1.0 |
| 12 | 403 | 54 (376,430) | 13 | 0.00236 | 1.0 |
| 13 | 468 | 65 (435,501) | 14 | 0.00236 | 1.0 |
| 14 | 544 | 76 (506,582) | 14 | 0.00236 | 1.0 |
| 15 | 631 | 87 (587,674) | 14 | 0.00236 | 1.0 |
| 16 | 734 | 108 (680,788) | 15 | 0.00236 | 1.0 |
| 17 | 853 | 119 (794,913) | 14 | 0.00236 | 1.0 |
| 18 | 994 | 152 (918,1070) | 15 | 0.00236 | 1.0 |
| 19 | 1154 | 157 (1076,1233) | 14 | 0.00236 | 1.0 |
| 20 | 1295 | 114 (1238,1352) | 9 | 0.00236 | 1.0 |

Table 3: Energy/Flux Calibration Factors for the Proton Channels on Probe A. Valid from 31 Mar 2013 00:00:00 to 14 Oct 2019 14:27:00. Main rate LUTID: 29954.

| Chan # | E [keV] | $\Delta E (E_{lo}, E_{hi})$ [keV] | $\Delta E/E$ [%] | G [cm ² sr] | ϵ |
|--------|-----------|-----------------------------------|------------------|--------------------------|------------|
| 0 | 58 | 5 (56,61) | 9 | 0.00236 | 1.0 |
| 1 | 69 | 5 (67,72) | 8 | 0.00236 | 1.0 |
| 2 | 83 | 11 (77,88) | 13 | 0.00236 | 1.0 |
| 3 | 99 | 11 (94,105) | 11 | 0.00236 | 1.0 |
| 4 | 118 | 16 (110,126) | 14 | 0.00236 | 1.0 |
| 5 | 140 | 16 (132,148) | 12 | 0.00236 | 1.0 |
| 6 | 164 | 22 (153,175) | 13 | 0.00236 | 1.0 |
| 7 | 194 | 27 (180,208) | 14 | 0.00236 | 1.0 |
| 8 | 229 | 33 (213,246) | 14 | 0.00236 | 1.0 |
| 9 | 267 | 33 (251,284) | 12 | 0.00236 | 1.0 |
| 10 | 308 | 38 (289,327) | 12 | 0.00236 | 1.0 |
| 11 | 357 | 49 (332,381) | 14 | 0.00236 | 1.0 |
| 12 | 414 | 54 (387,441) | 13 | 0.00236 | 1.0 |
| 13 | 479 | 65 (446,511) | 14 | 0.00236 | 1.0 |
| 14 | 555 | 76 (517,593) | 14 | 0.00236 | 1.0 |
| 15 | 636 | 76 (598,674) | 12 | 0.00236 | 1.0 |
| 16 | 728 | 98 (680,777) | 13 | 0.00236 | 1.0 |
| 17 | 840 | 114 (783,897) | 14 | 0.00236 | 1.0 |
| 18 | 967 | 130 (902,1032) | 13 | 0.00236 | 1.0 |
| 19 | 1111 | 146 (1038,1184) | 13 | 0.00236 | 1.0 |
| 20 | 1271 | 163 (1190,1352) | 13 | 0.00236 | 1.0 |

Table 4: Energy/Flux Calibration Factors for the Proton Channels on Probe B. Valid from 06 Sep 2012 00:00:00 to 29 Sep 2012 00:00:00. Main rate LUTID: 32000. Note that channel 20 should be considered invalid (it has PHA 255 junk bin included).

| Chan # | E [keV] | $\Delta E (E_{lo}, E_{hi})$ [keV] | $\Delta E/E$ [%] | G [cm ² sr] | ϵ |
|-----------|--------------|--------------------------------------|---------------------|-----------------------------|------------|
| 0 | 63 | 5 (60,65) | 9 | 0.00236 | 1.0 |
| 1 | 74 | 5 (71,76) | 7 | 0.00236 | 1.0 |
| 2 | 84 | 5 (82,87) | 6 | 0.00236 | 1.0 |
| 3 | 98 | 11 (93,103) | 11 | 0.00236 | 1.0 |
| 4 | 114 | 11 (109,120) | 9 | 0.00236 | 1.0 |
| 5 | 133 | 16 (125,141) | 12 | 0.00236 | 1.0 |
| 6 | 155 | 16 (147,163) | 10 | 0.00236 | 1.0 |
| 7 | 179 | 22 (168,190) | 12 | 0.00236 | 1.0 |
| 8 | 206 | 22 (195,217) | 11 | 0.00236 | 1.0 |
| 9 | 239 | 33 (223,255) | 14 | 0.00236 | 1.0 |
| 10 | 277 | 33 (260,293) | 12 | 0.00236 | 1.0 |
| 11 | 320 | 43 (298,342) | 14 | 0.00236 | 1.0 |
| 12 | 371 | 49 (347,396) | 13 | 0.00236 | 1.0 |
| 13 | 431 | 60 (401,461) | 14 | 0.00236 | 1.0 |
| 14 | 499 | 65 (466,531) | 13 | 0.00236 | 1.0 |
| 15 | 577 | 81 (537,618) | 14 | 0.00236 | 1.0 |
| 16 | 669 | 92 (623,715) | 14 | 0.00236 | 1.0 |
| 17 | 772 | 103 (721,824) | 13 | 0.00236 | 1.0 |
| 18 | 891 | 125 (829,954) | 14 | 0.00236 | 1.0 |
| 19 | 1032 | 146 (959,1105) | 14 | 0.00236 | 1.0 |
| 20 | 1203 | 184 (1111,1295) | 15 | 0.00236 | 1.0 |

Table 5: Energy/Flux Calibration Factors for the Proton Channels on Probe B. Valid from 29 Sep 2012 00:00:00 to 16 Jul 2019 16:58:00. Main rate LUTID: 32001.

| Chan # | E [keV] | $\Delta E (E_{lo}, E_{hi})$ [keV] | $\Delta E/E$ [%] | G [cm ² sr] | ϵ |
|-----------|--------------|--------------------------------------|---------------------|-----------------------------|------------|
| 0 | 63 | 5 (60,65) | 9 | 0.00236 | 1.0 |
| 1 | 74 | 5 (71,76) | 7 | 0.00236 | 1.0 |
| 2 | 84 | 5 (82,87) | 6 | 0.00236 | 1.0 |
| 3 | 98 | 11 (93,103) | 11 | 0.00236 | 1.0 |
| 4 | 114 | 11 (109,120) | 9 | 0.00236 | 1.0 |
| 5 | 133 | 16 (125,141) | 12 | 0.00236 | 1.0 |
| 6 | 155 | 16 (147,163) | 10 | 0.00236 | 1.0 |
| 7 | 179 | 22 (168,190) | 12 | 0.00236 | 1.0 |
| 8 | 206 | 22 (195,217) | 11 | 0.00236 | 1.0 |
| 9 | 239 | 32 (223,255) | 14 | 0.00236 | 1.0 |
| 10 | 277 | 32 (260,293) | 12 | 0.00236 | 1.0 |
| 11 | 320 | 43 (298,342) | 14 | 0.00236 | 1.0 |
| 12 | 371 | 49 (347,396) | 13 | 0.00236 | 1.0 |
| 13 | 431 | 60 (401,461) | 14 | 0.00236 | 1.0 |
| 14 | 499 | 65 (466,531) | 13 | 0.00236 | 1.0 |
| 15 | 577 | 81 (537,618) | 14 | 0.00236 | 1.0 |
| 16 | 669 | 92 (623,715) | 14 | 0.00236 | 1.0 |
| 17 | 772 | 103 (721,824) | 13 | 0.00236 | 1.0 |
| 18 | 891 | 125 (829,954) | 14 | 0.00236 | 1.0 |
| 19 | 1032 | 146 (959,1105) | 14 | 0.00236 | 1.0 |
| 20 | 1206 | 190 (1111,1300) | 16 | 0.00236 | 1.0 |