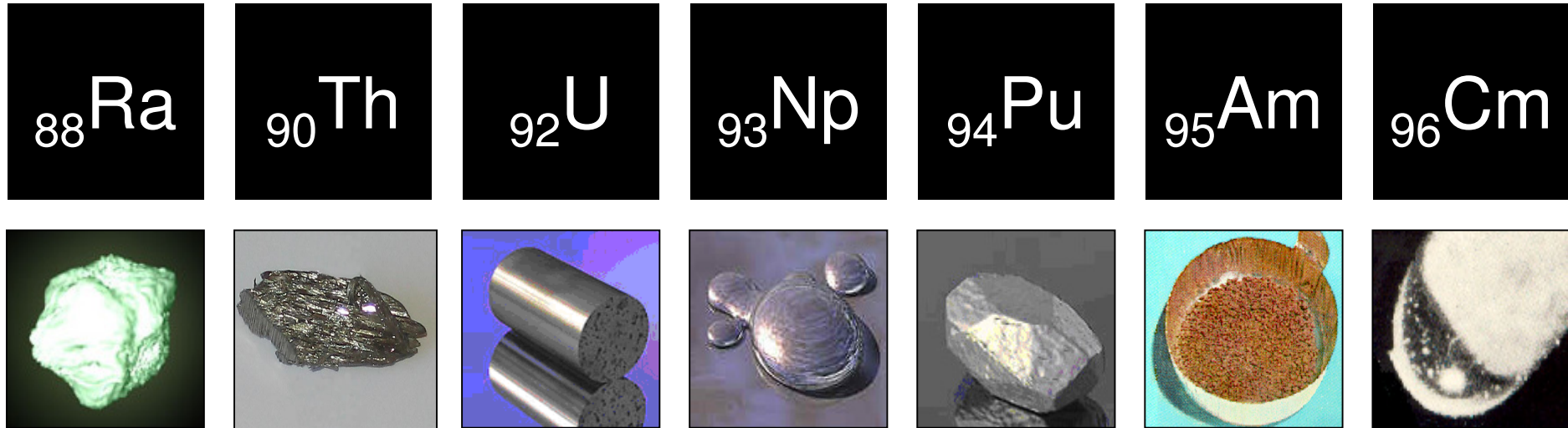


AL and AH samples 2009



Chris Gilligan
National Physical Laboratory
20 January 2010

Radionuclides in AH (1-20 Bq/g)

²²⁶Ra, ²³⁷Np, **²³⁸Pu**, ²³⁹Pu, ²⁴¹Am, ²⁴⁴Cm

Radionuclides in AL

²³²Th, ²³⁷Np, **²³⁸U**, ²³⁹Pu, ²⁴¹Am, ²⁴⁴Cm

Participants:

AL **32** (2007:- 23, 2008:- 25)

AH **17** (2007:- 17, 2008:- 16)

AH composition (Bq g⁻¹)

20 g Sample

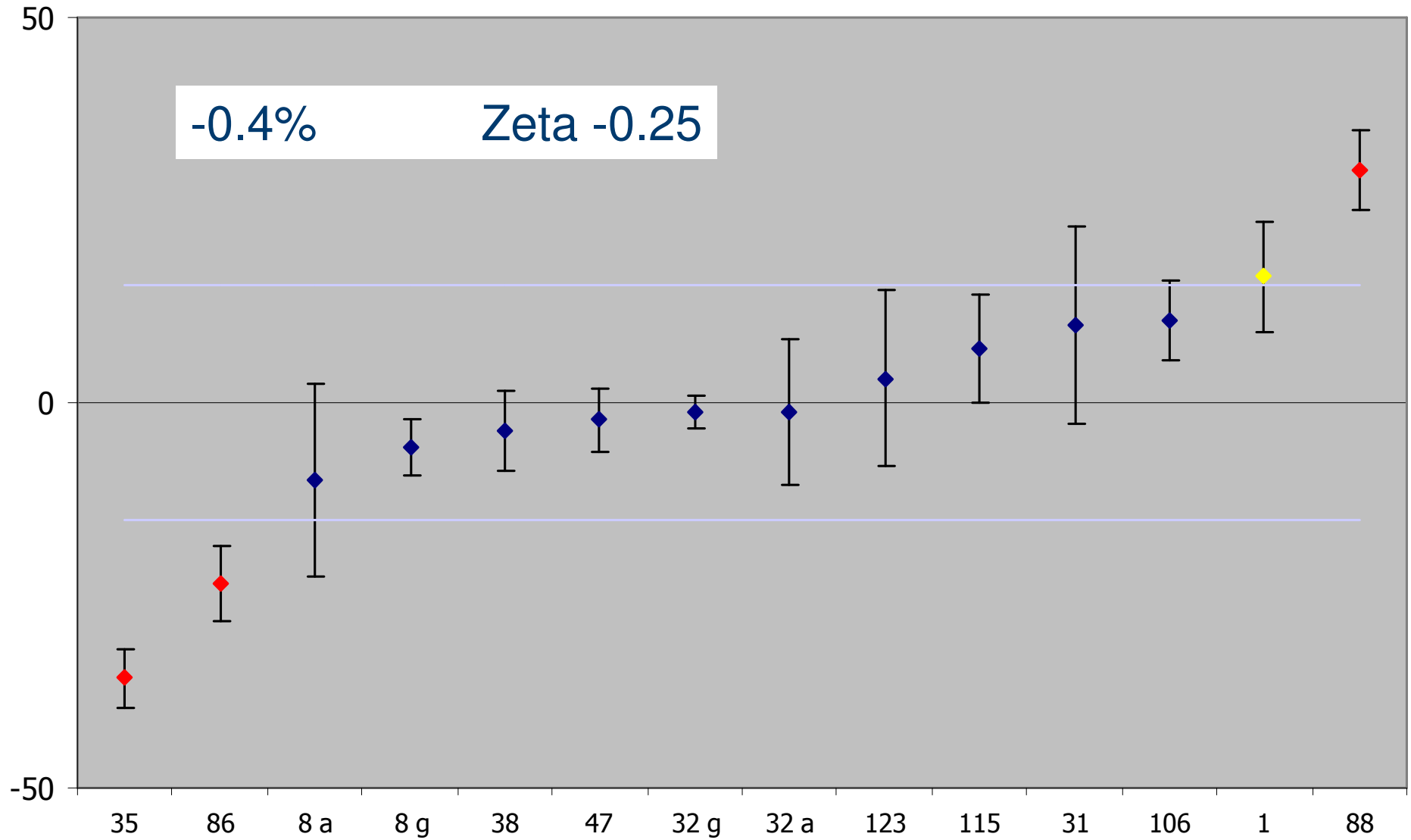
| | NPL | Labs | % | Zeta |
|-------------------|-----------|-----------|-------------|--------------|
| ²²⁶ Ra | 15.90(21) | 15.83(20) | -0.4 | -0.25 |
| ²³⁷ Np | 4.84(5) | 4.67(13) | -3.5 | -1.19 |
| ²³⁸ Pu | 16.63(5) | 16.41(19) | -1.3 | -1.07 |
| ²³⁹ Pu | 11.31(5) | 11.00(12) | -2.7 | -1.96 |
| ²⁴¹ Am | 5.356(10) | 5.37(5) | 0.3 | 0.38 |
| ²⁴⁴ Cm | 6.980(22) | 6.59(11) | -5.6 | -3.61 |
| Gross Alpha | 80(30) | 67.1(14) | -16 | -0.43 |

AL composition (Bq kg⁻¹)

500 g Sample

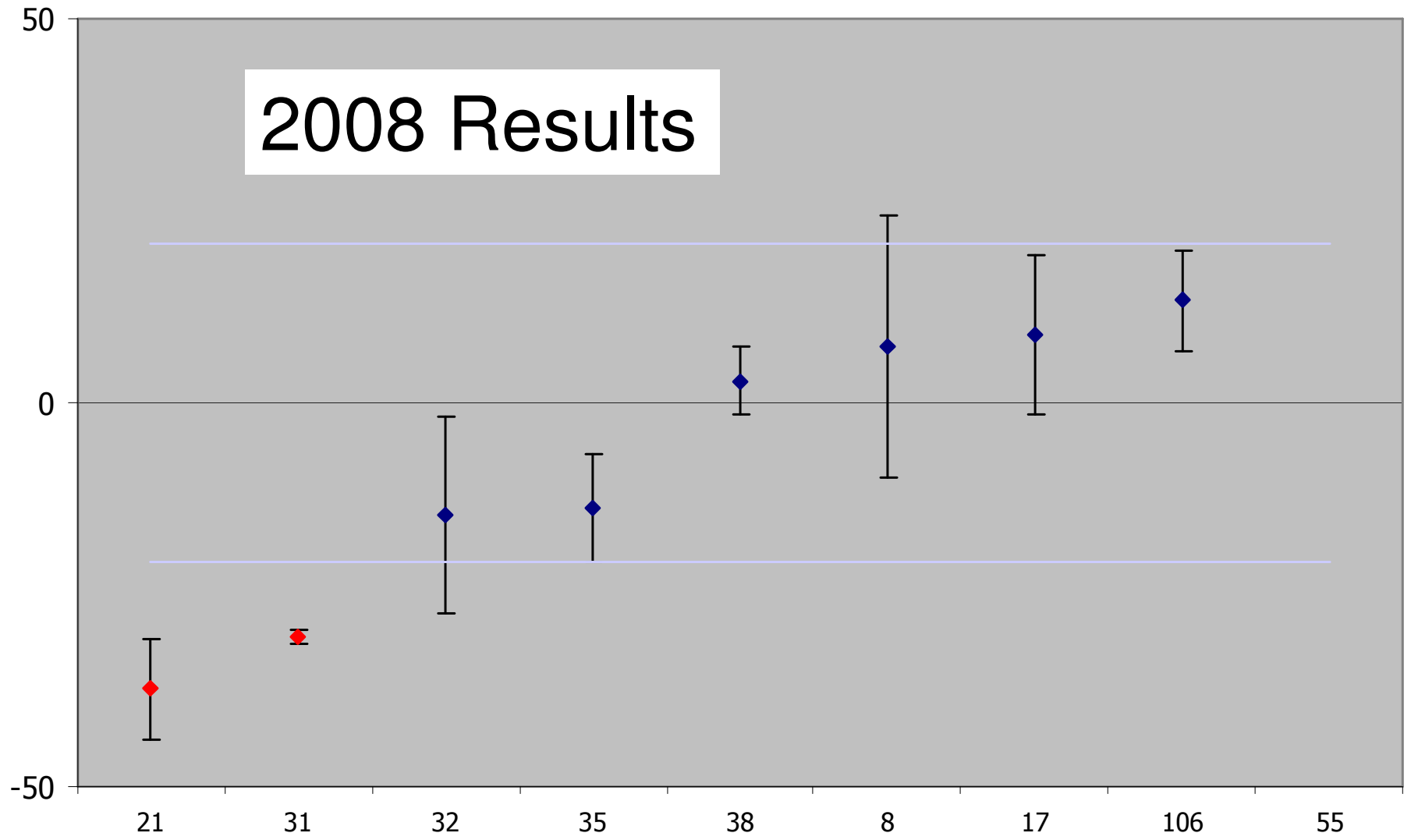
| | NPL | Labs | % | Zeta |
|-------------------|-----------|-----------|------|-------|
| ²³² Th | 5.01(5) | 4.94(6) | -1.4 | -0.94 |
| ²³⁷ Np | 4.65(5) | 4.72(18) | 1.5 | 0.41 |
| ²³⁸ U | 18.0(4) | 17.99(3) | -0.1 | 0.04 |
| ²³⁹ Pu | 11.77(12) | 11.02(11) | -6.4 | -4.16 |
| ²⁴¹ Am | 3.099(6) | 3.05(3) | -1.8 | -1.62 |
| ²⁴⁴ Cm | 15.41(5) | 14.78(13) | -4.1 | -4.35 |
| Gross Alpha | 72(7) | 66.3(16) | -8 | -0.81 |

Deviation (%) Ra-226 AH

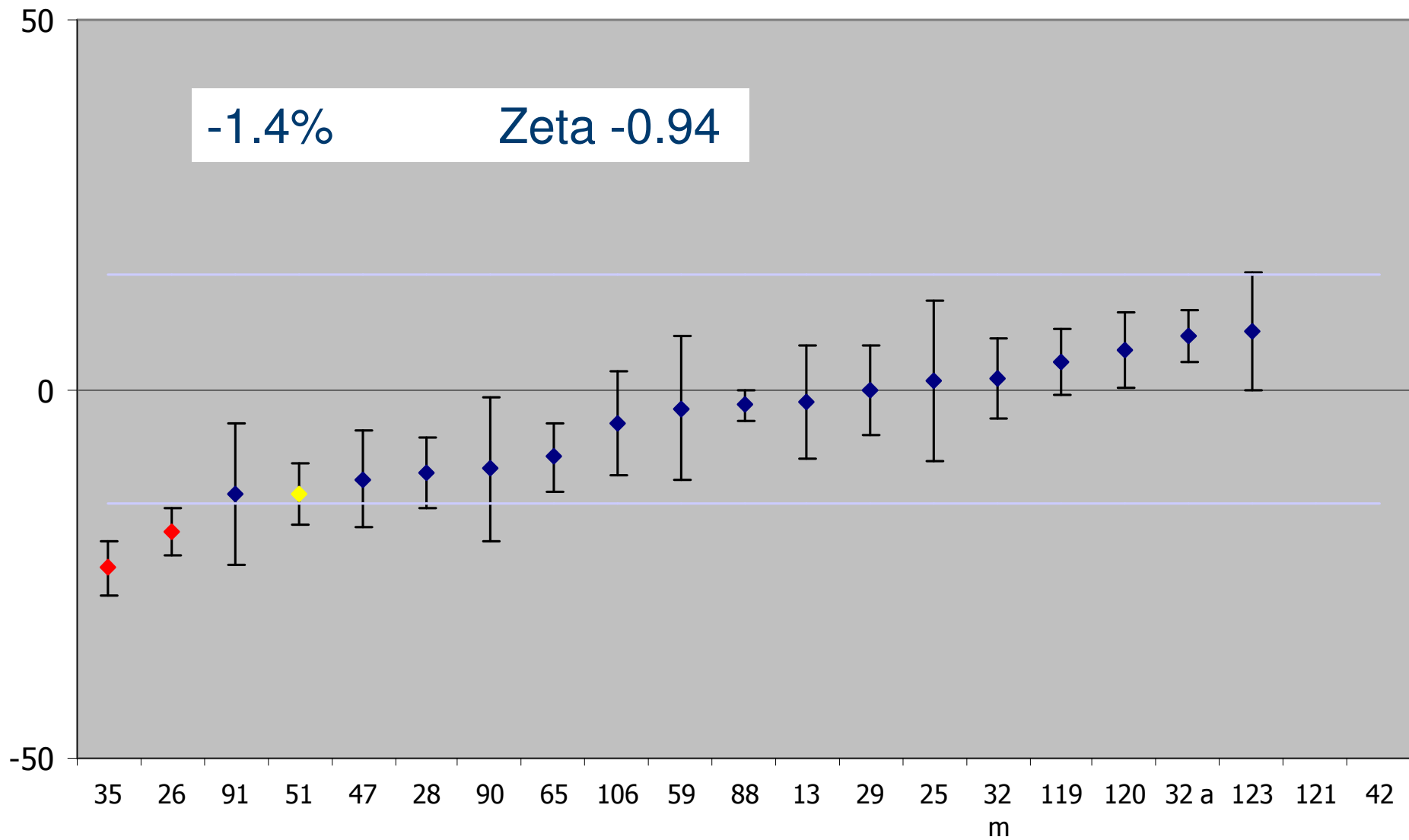


Deviation (%) Ra-226 AH

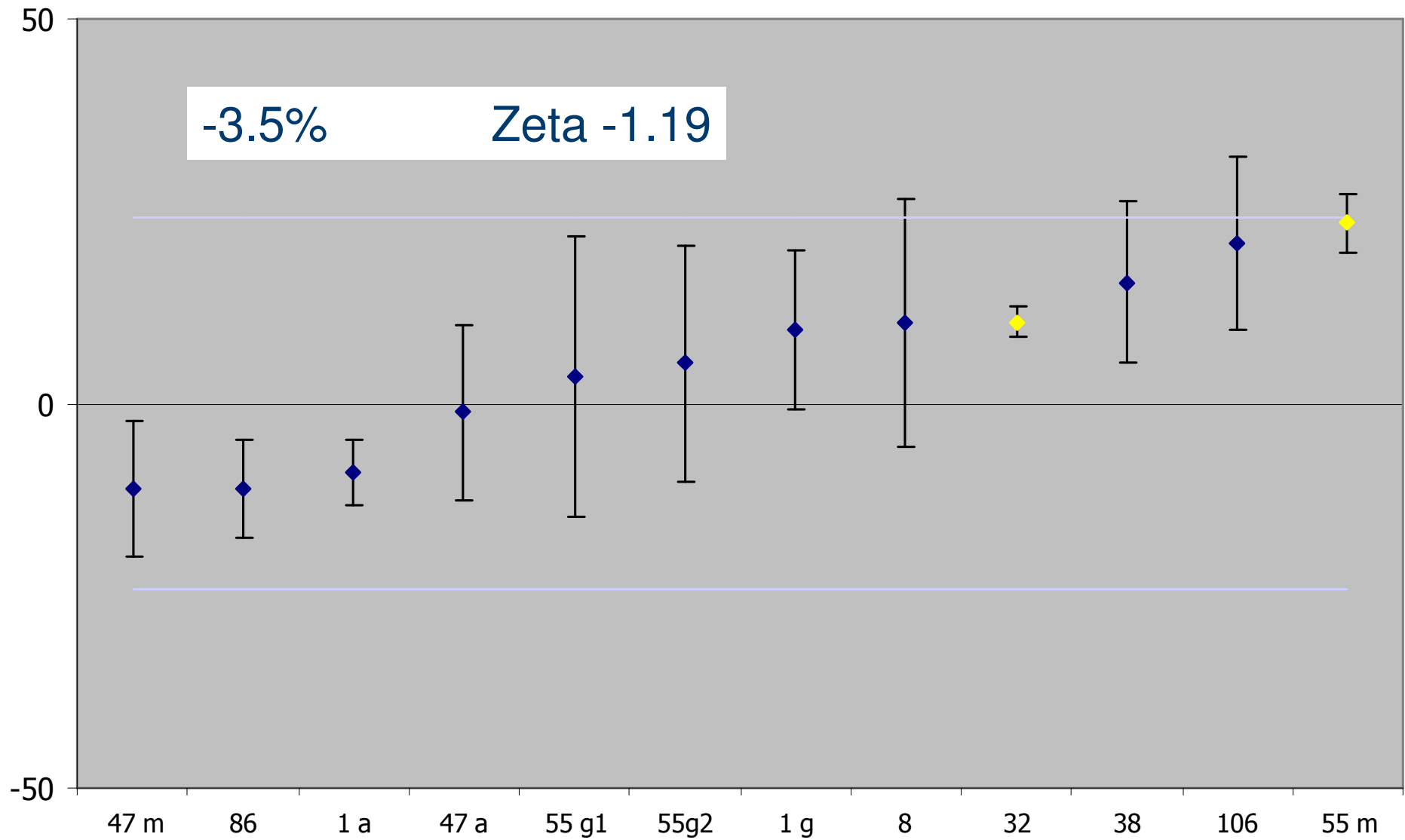
2008 Results



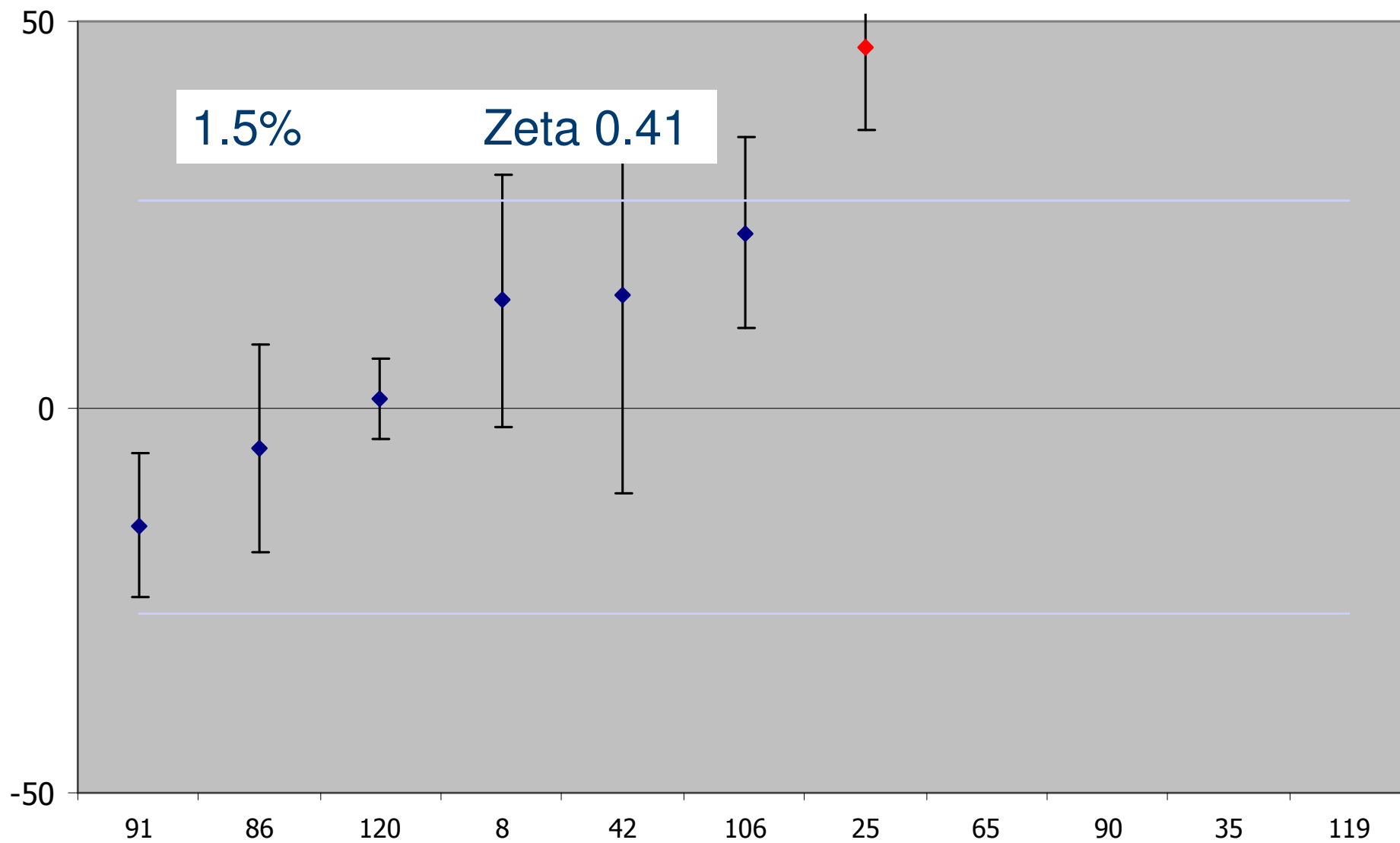
Deviation (%) Th-232 AL



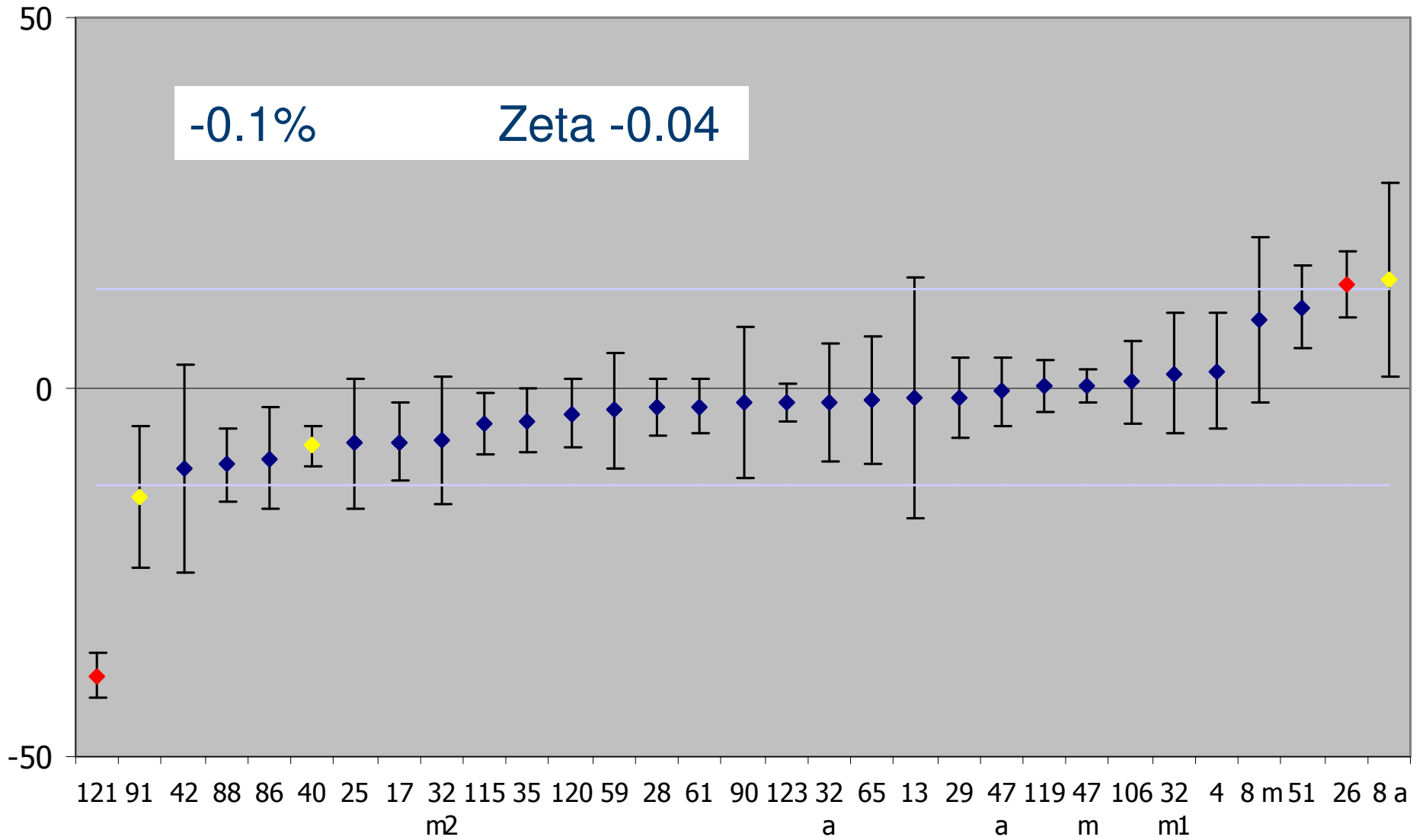
Deviation (%) Np-237 AH



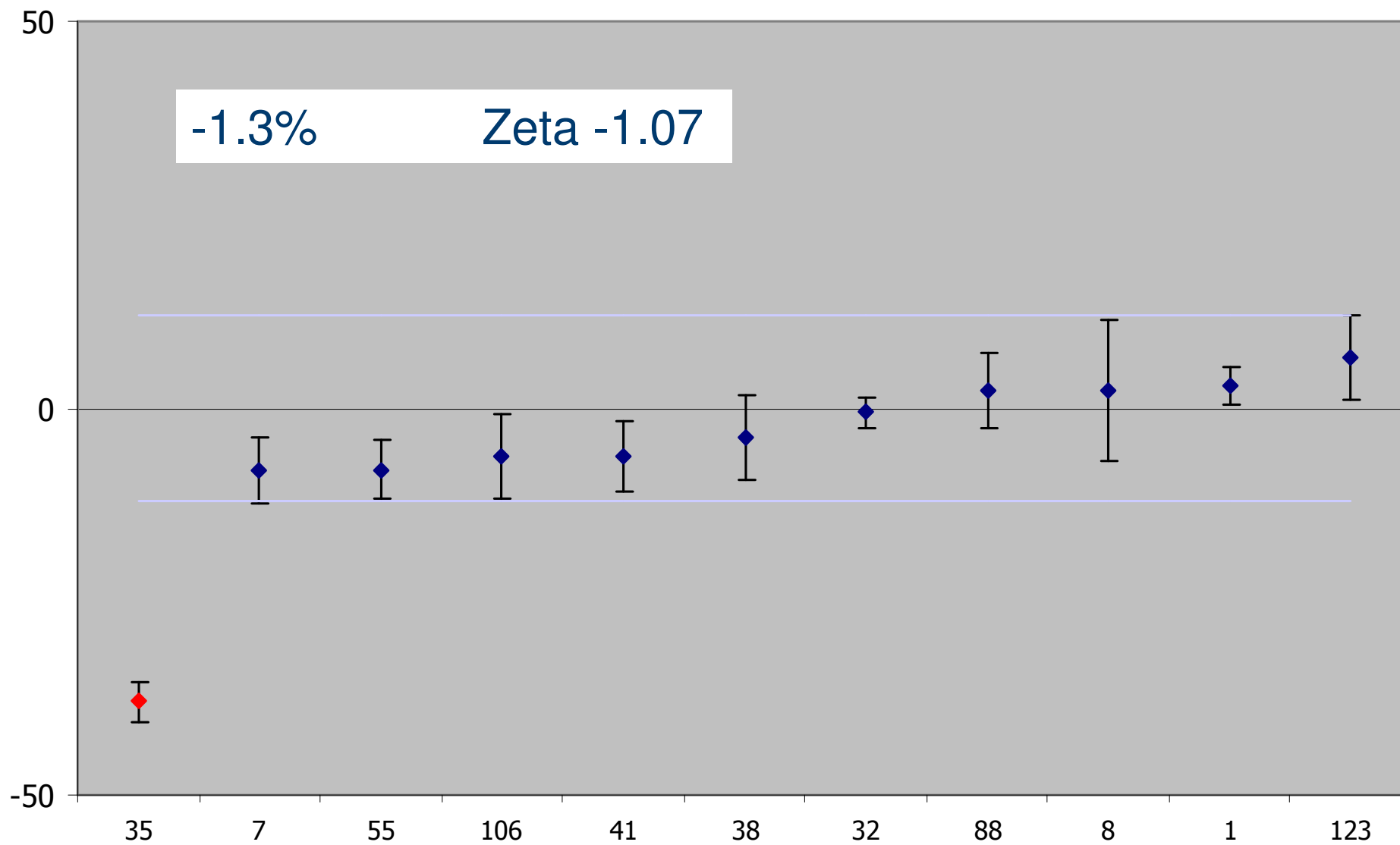
Deviation (%) Np-237 AL



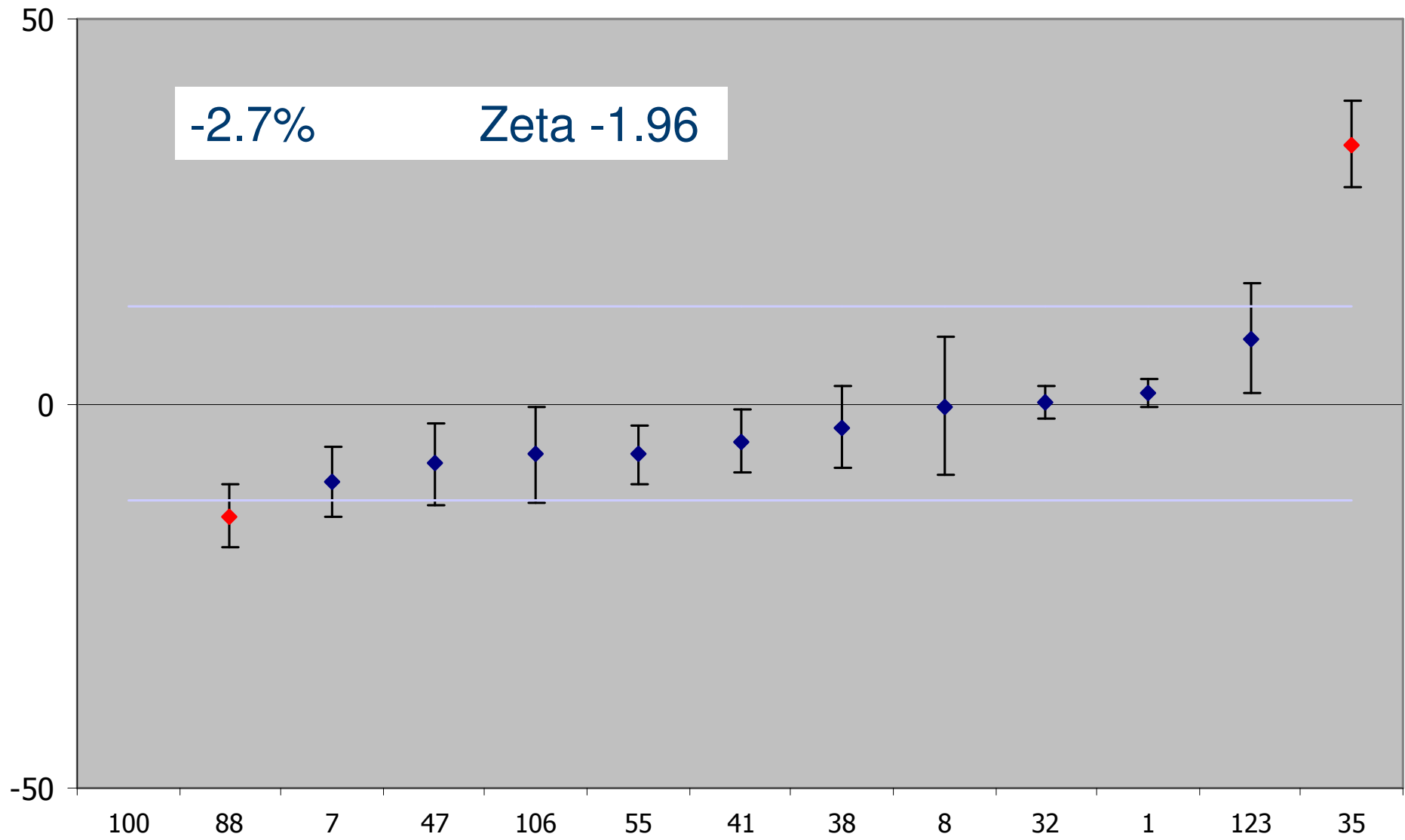
Deviation (%) U-238 AL



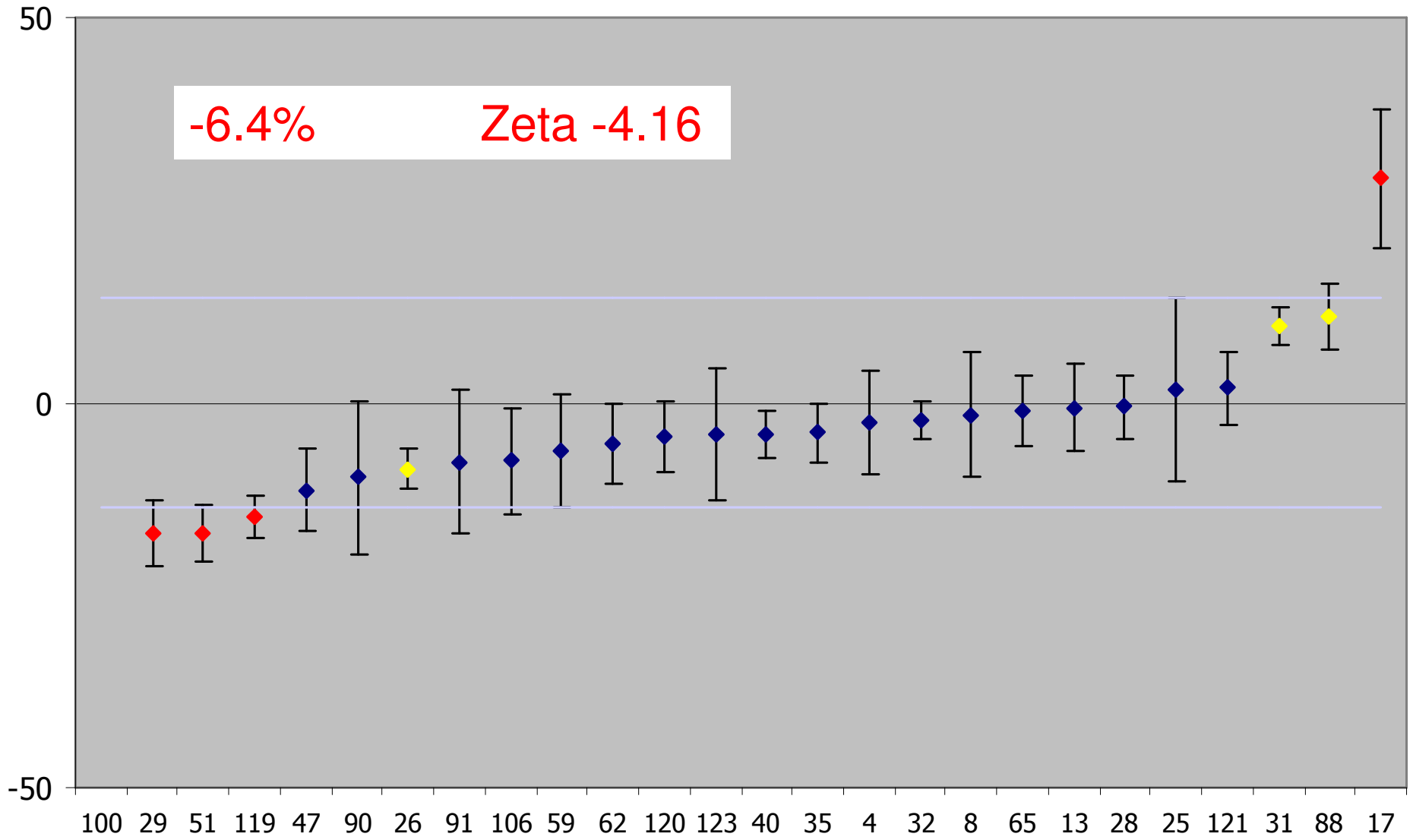
Deviation (%) Pu-238 AH



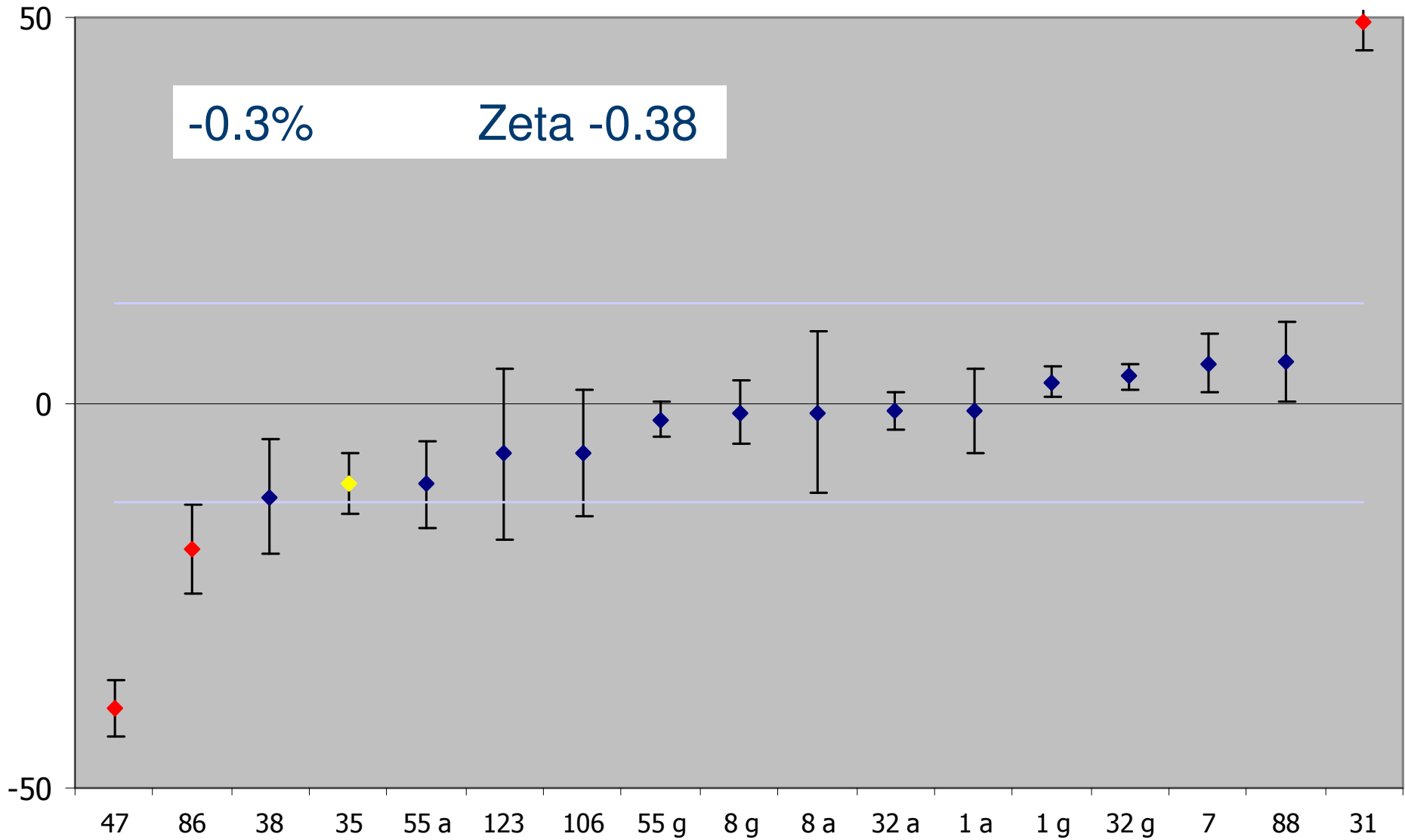
Deviation (%) Pu-239 AH



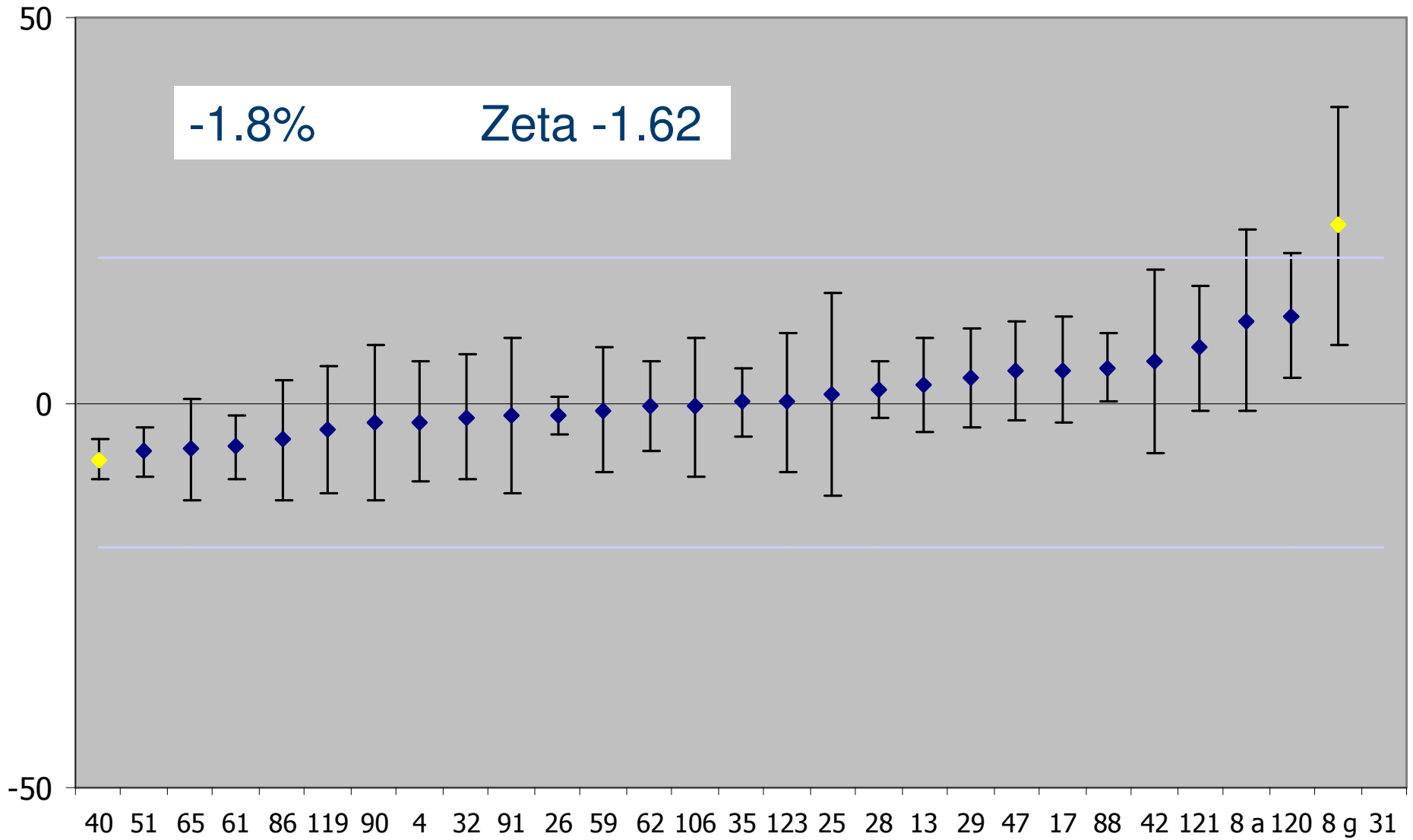
Deviation (%) Pu-239 AL



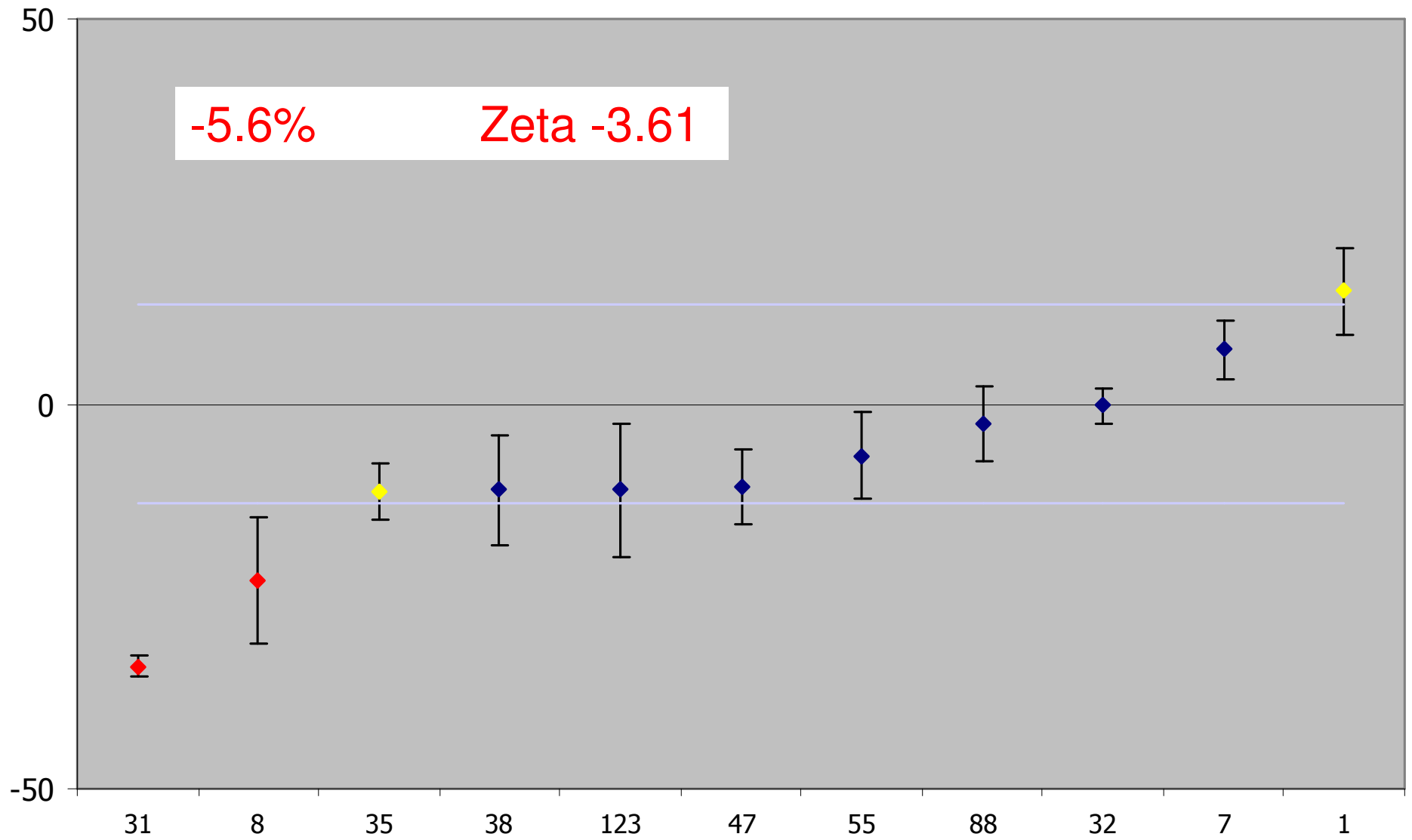
Deviation (%) Am-241 AH



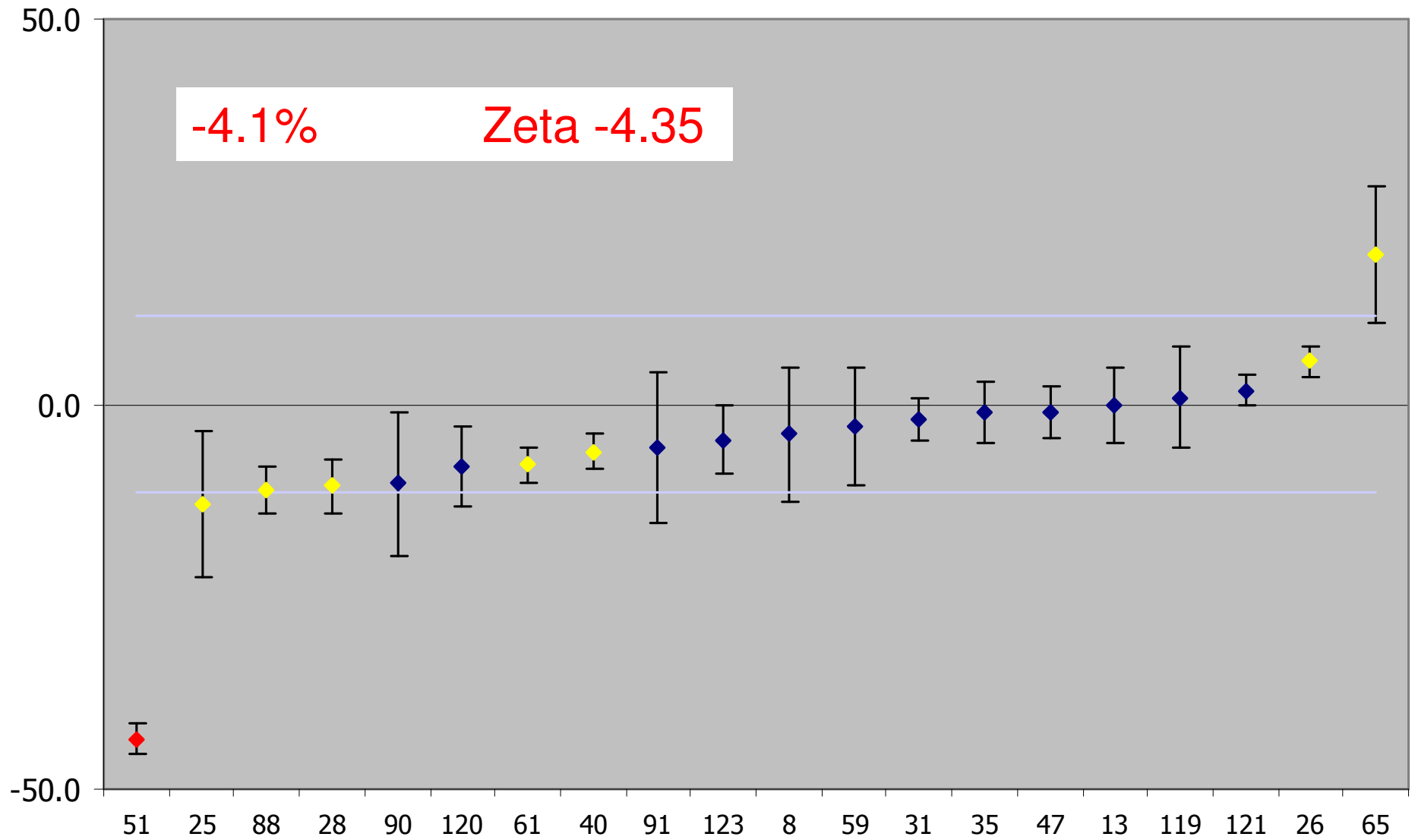
Deviation (%) Am-241 AL



Deviation (%) Cm-244 AH

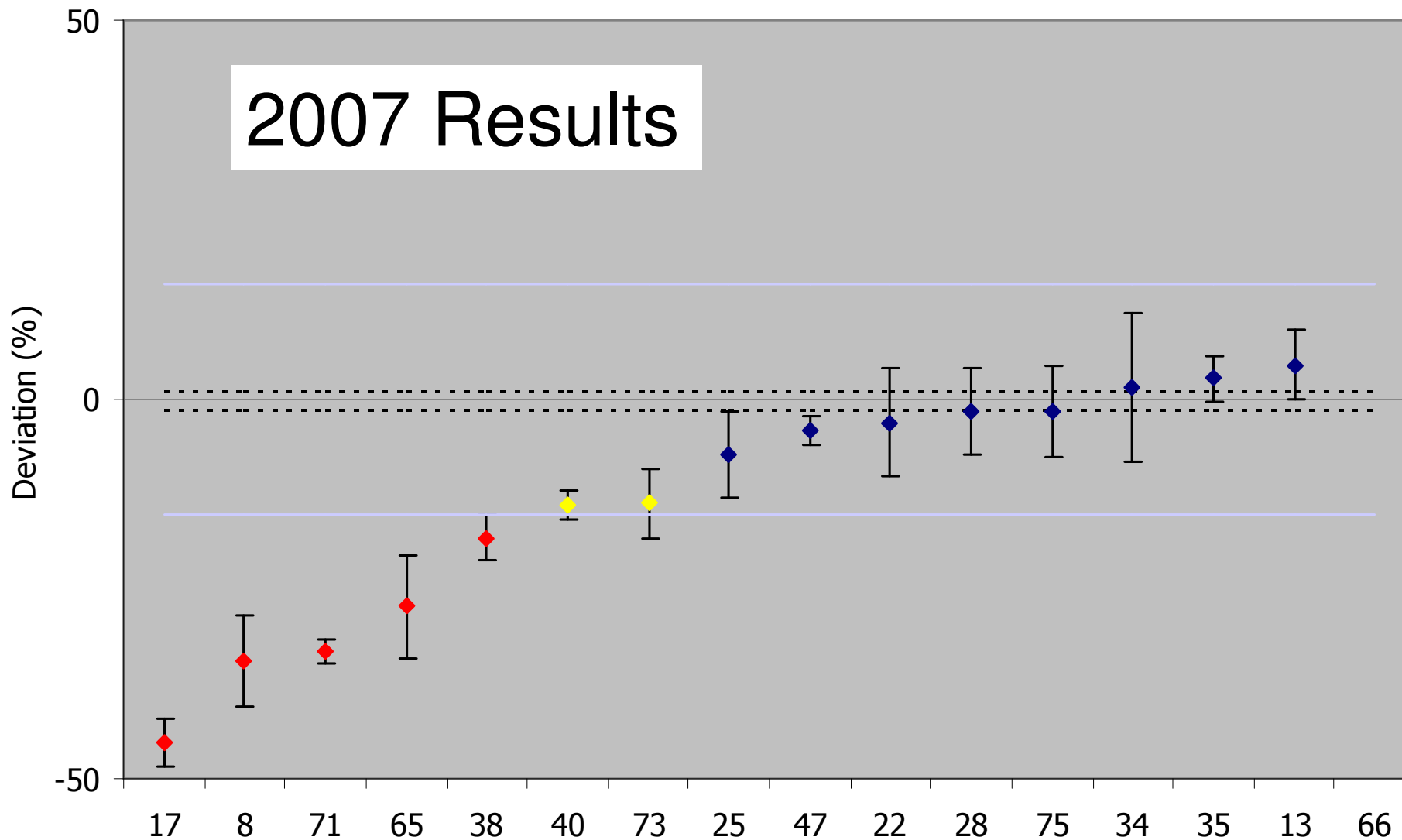


Deviation (%) Cm-244 AL

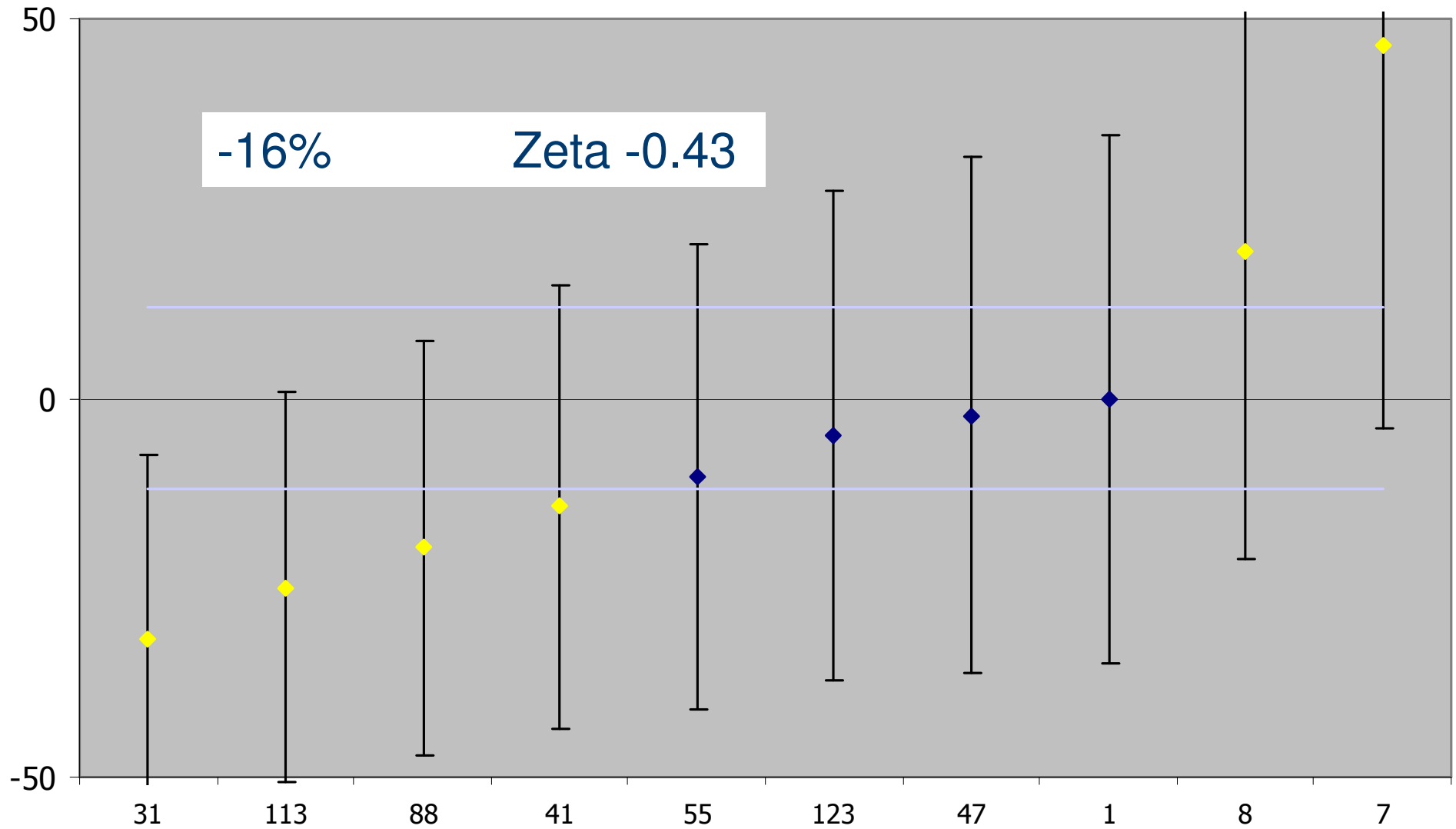


Deviation Cm-244 AL (2007 PTE)

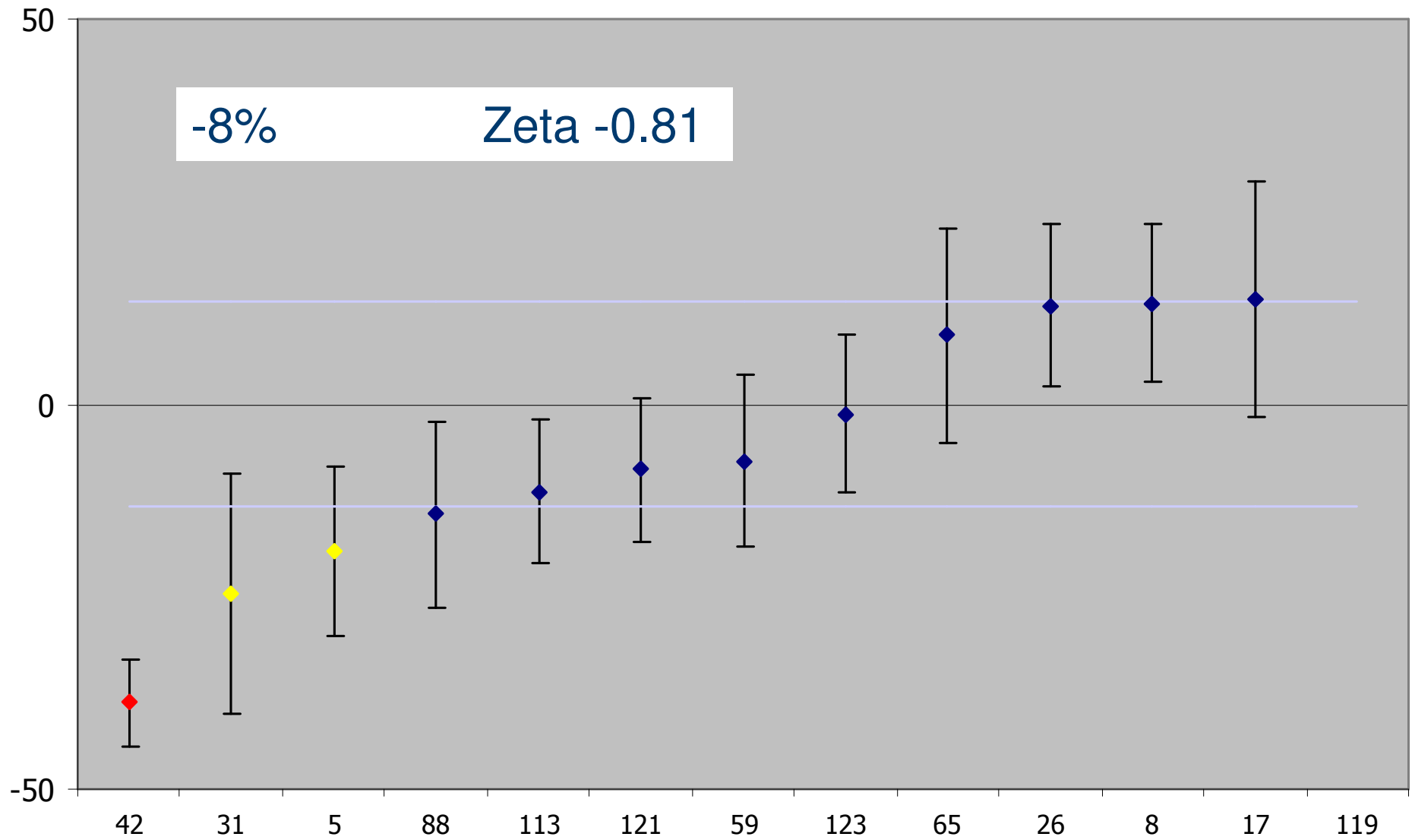
2007 Results



Deviation (%) Gross alpha AH



Deviation (%) Gross alpha AL



Summary of Alpha Results 2009

| | Deviation | Zeta |
|----------------------|-----------|-------|
| AL ^{244}Cm | -4.1% | -4.35 |
| AH ^{244}Cm | -5.6% | -3.61 |
| AL ^{239}Pu | -6.4% | -4.16 |

- ✓ WM LCS 'in agreement' with NPL
- ✓ Deviations all less than 3.5 %
(For all the other results)

Summary of Alpha Results

| AL 2009 | | (2007) | (2008) |
|------------|----------------|------------|------------|
| 74% | 'in agreement' | 77% | 73 % |
| 14% | 'questionable' | 8% | 14% |
| 13% | 'discrepant' | 15% | 13% |

| AH 2009 | | (2007) | (2008) |
|------------|----------------|-----------|------------|
| 73% | 'in agreement' | 74% | 69 % |
| 14% | 'questionable' | 17% | 16 % |
| 14% | 'discrepant' | 9% | 15% |

Thank you