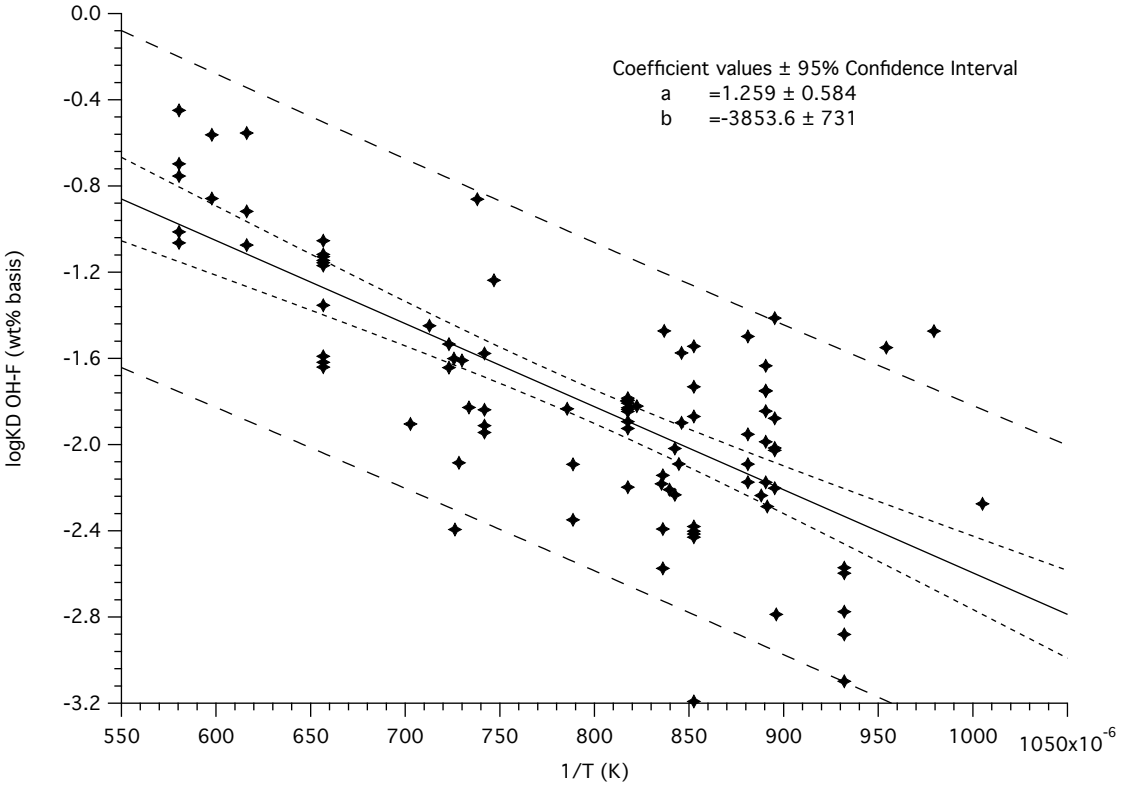
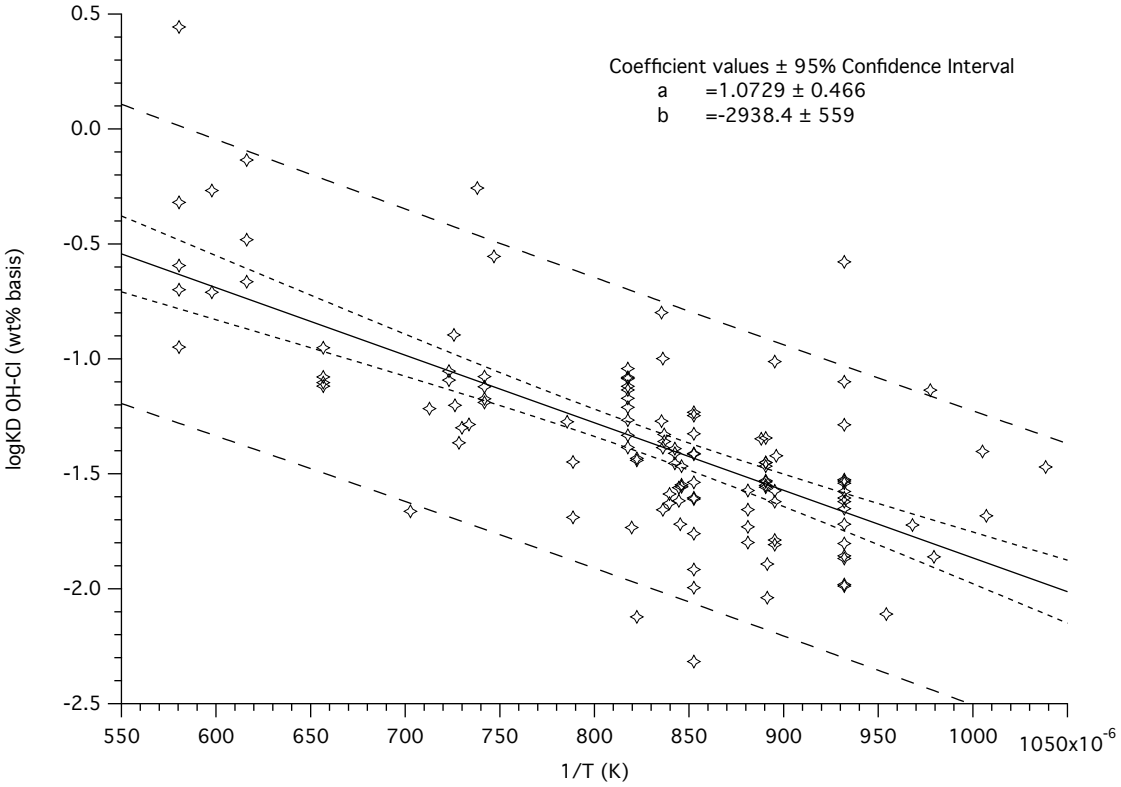
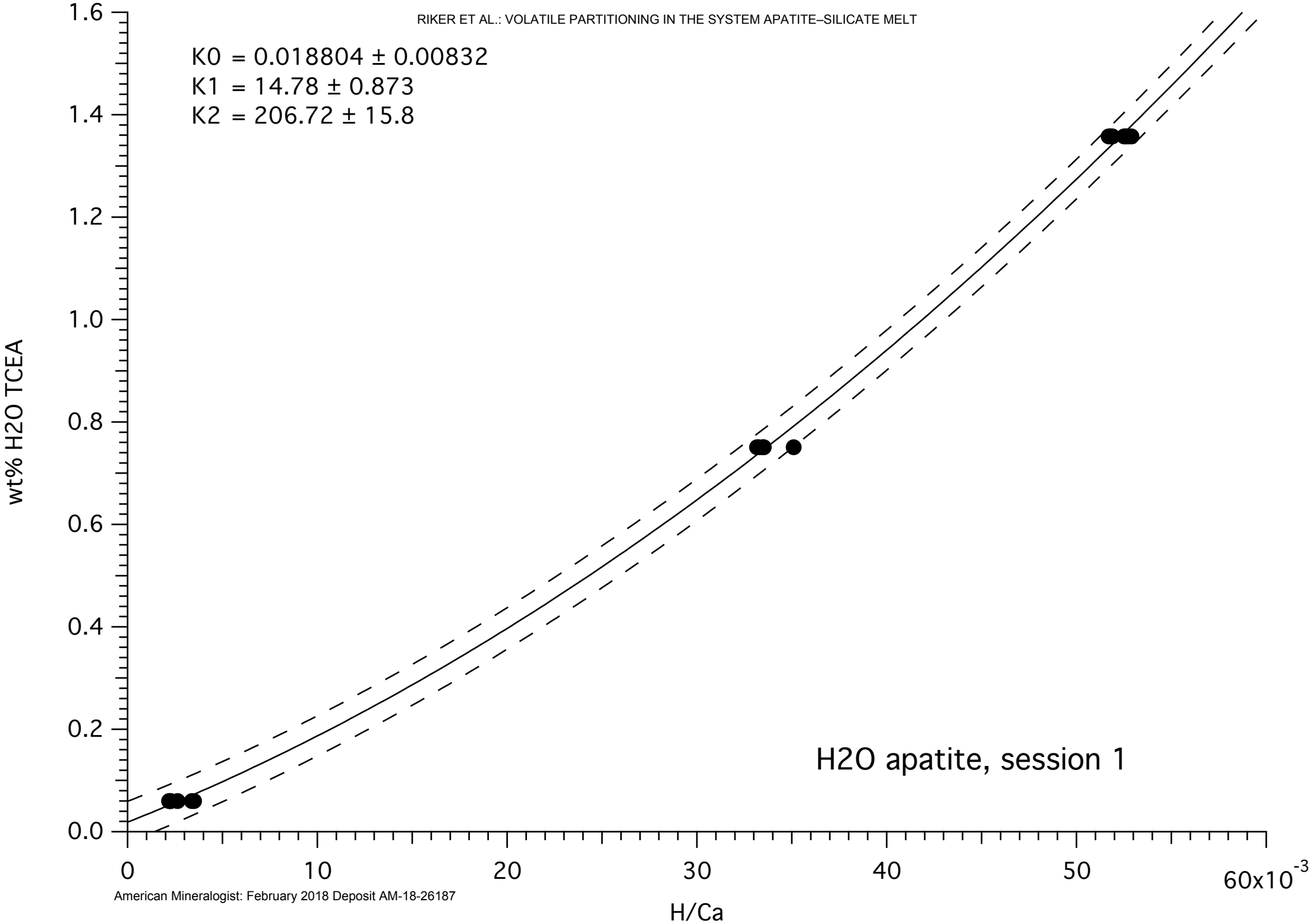
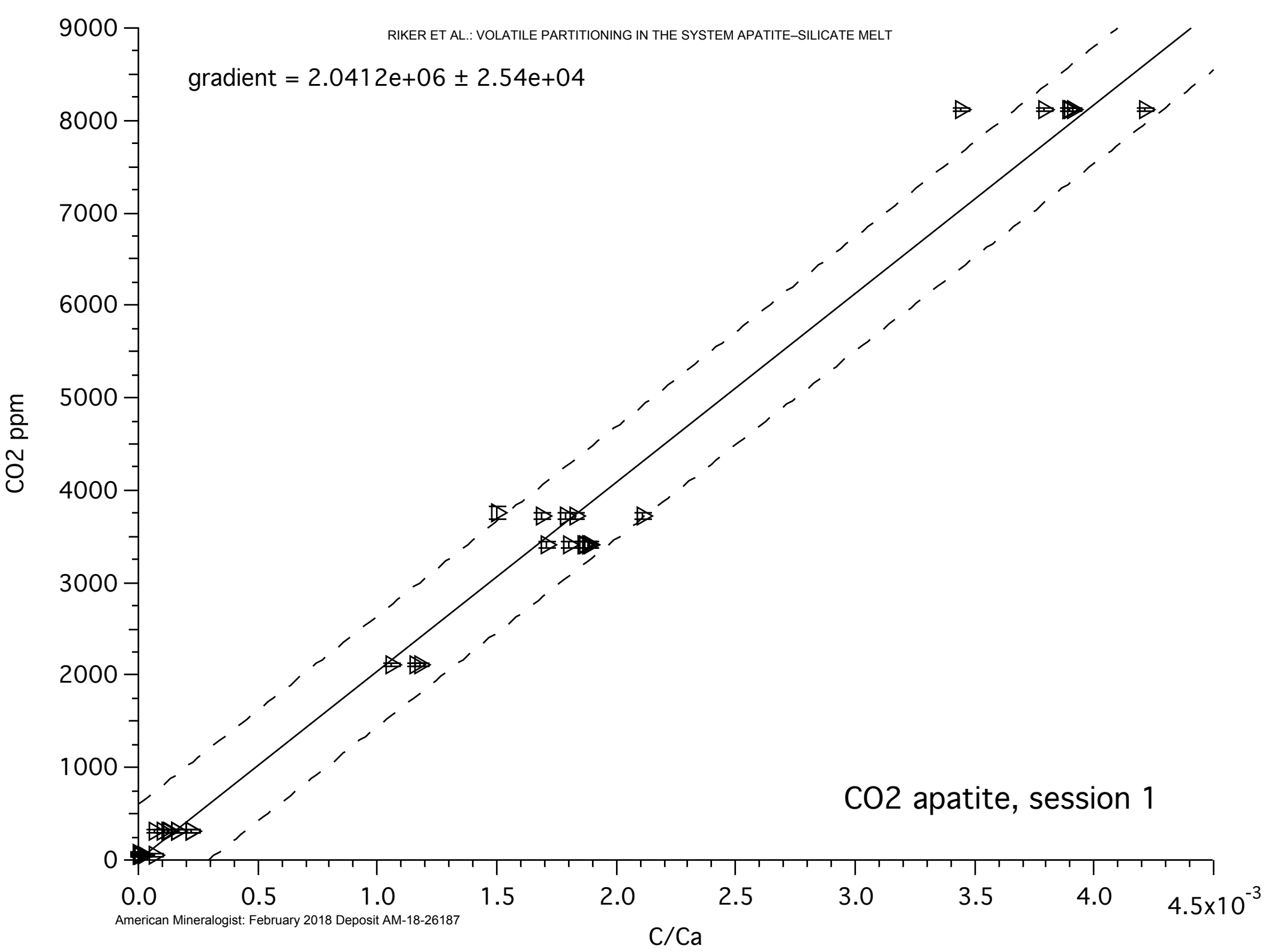
Results of multiple regression analysis for literature dataset of KD for OH-halogen exchange

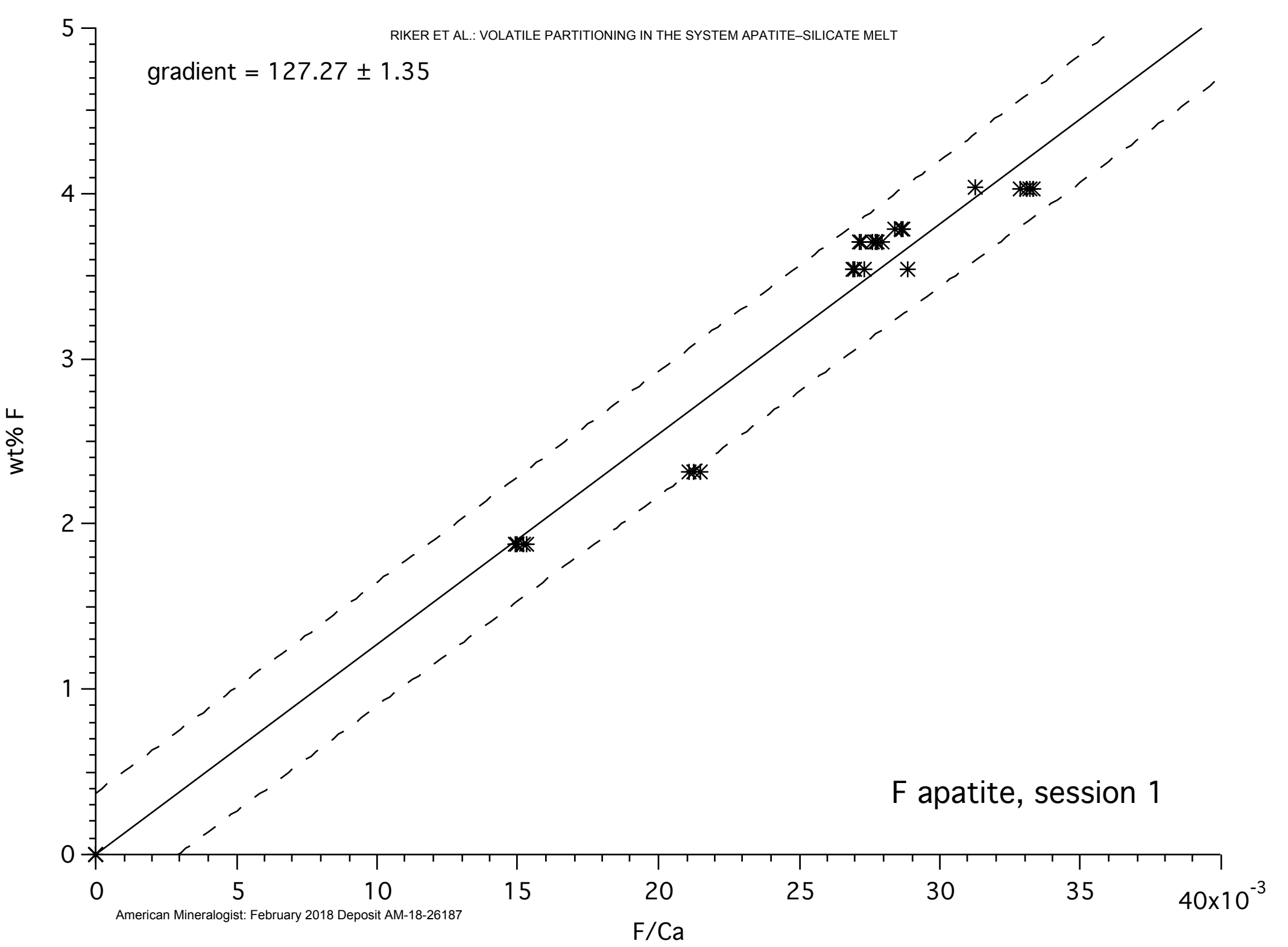


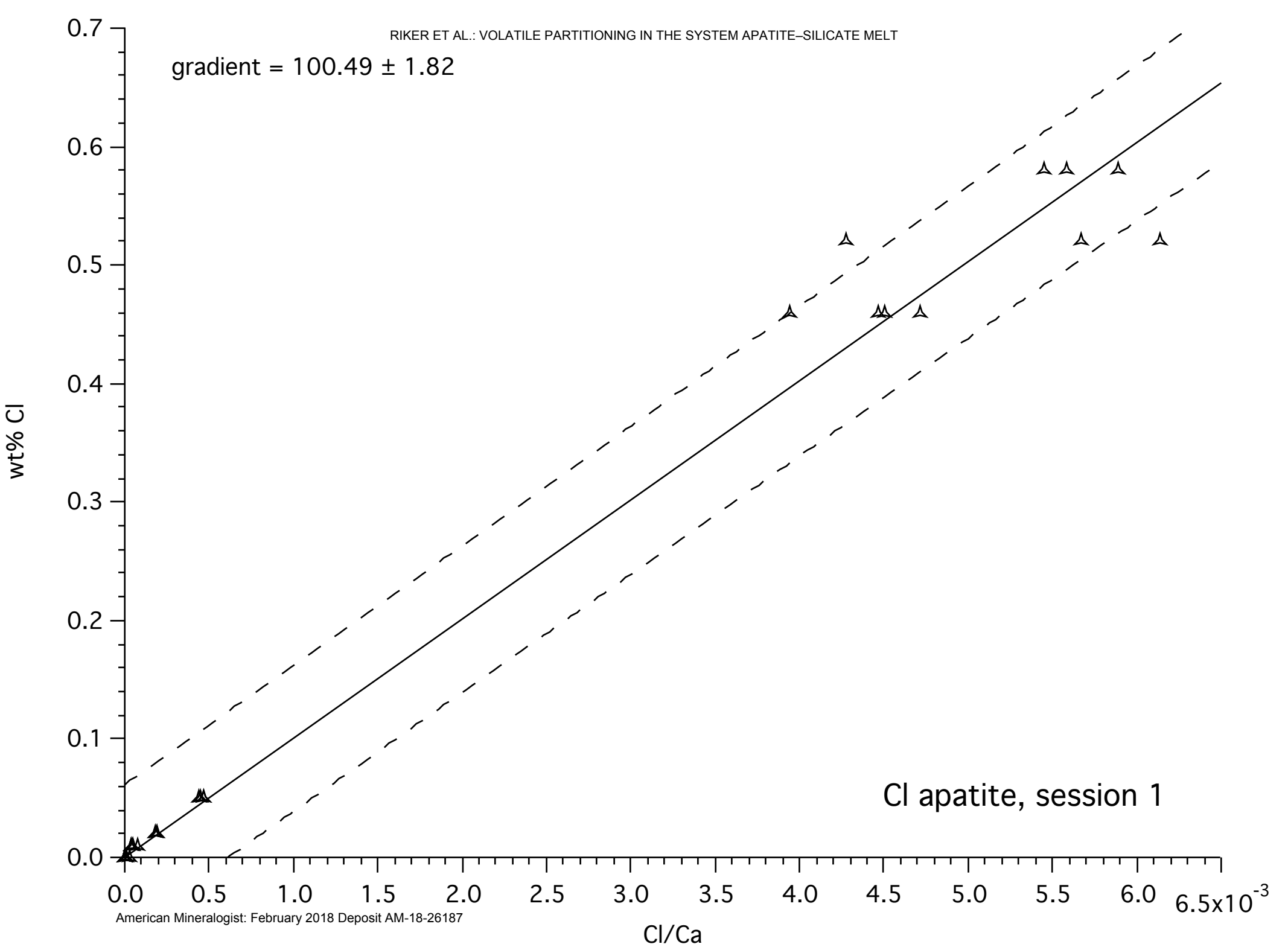
# Secondary ion mass spectrometry calibration lines for analytical session 1

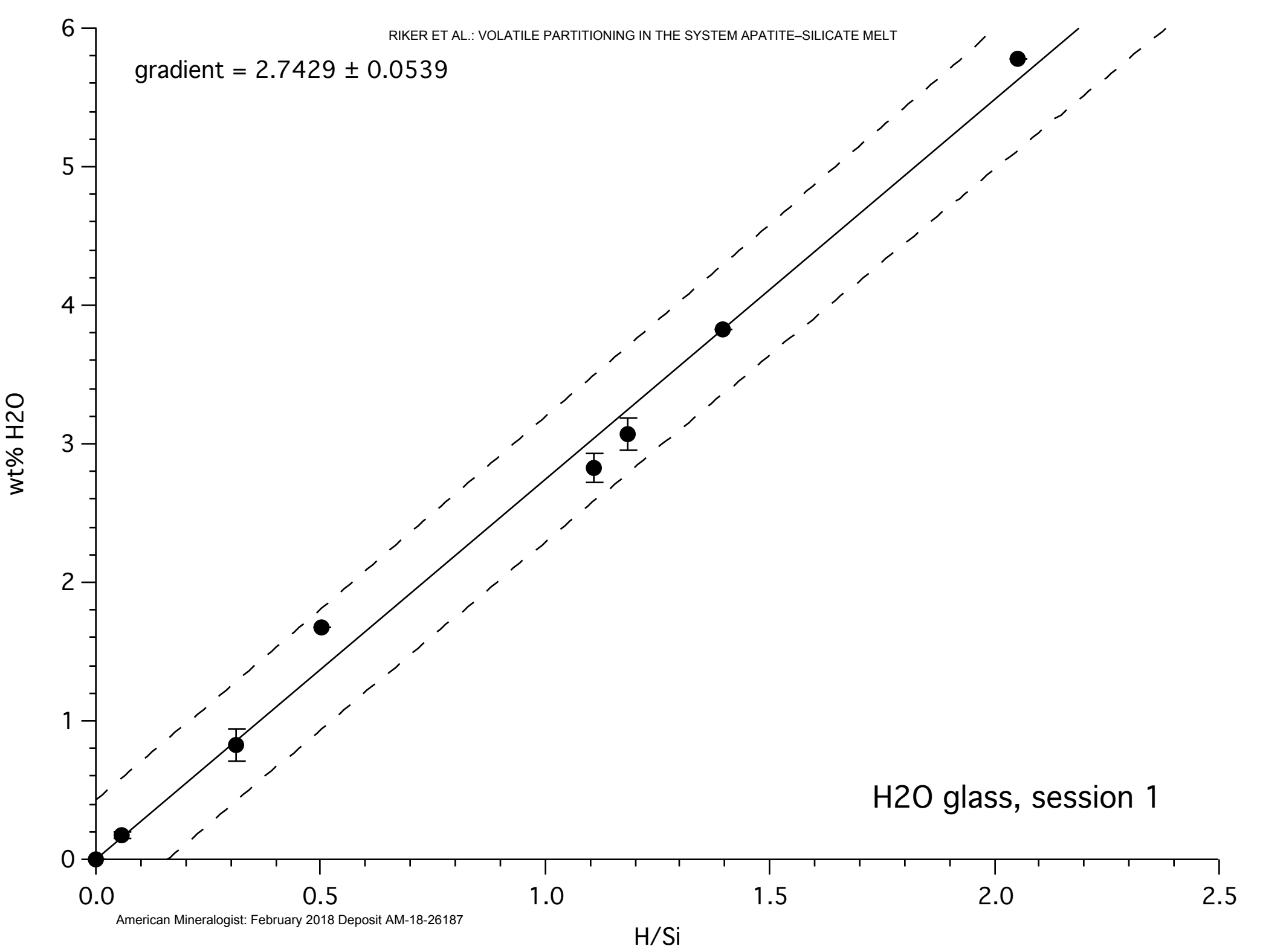

K0 = 0.018804 ± 0.00832
K1 = 14.78 ± 0.873
K2 = 206.72 ± 15.8
H2O apatite, session 1
wt% H2O TCEA
H/Ca
60x10-3
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
0
10
20
30
40
50

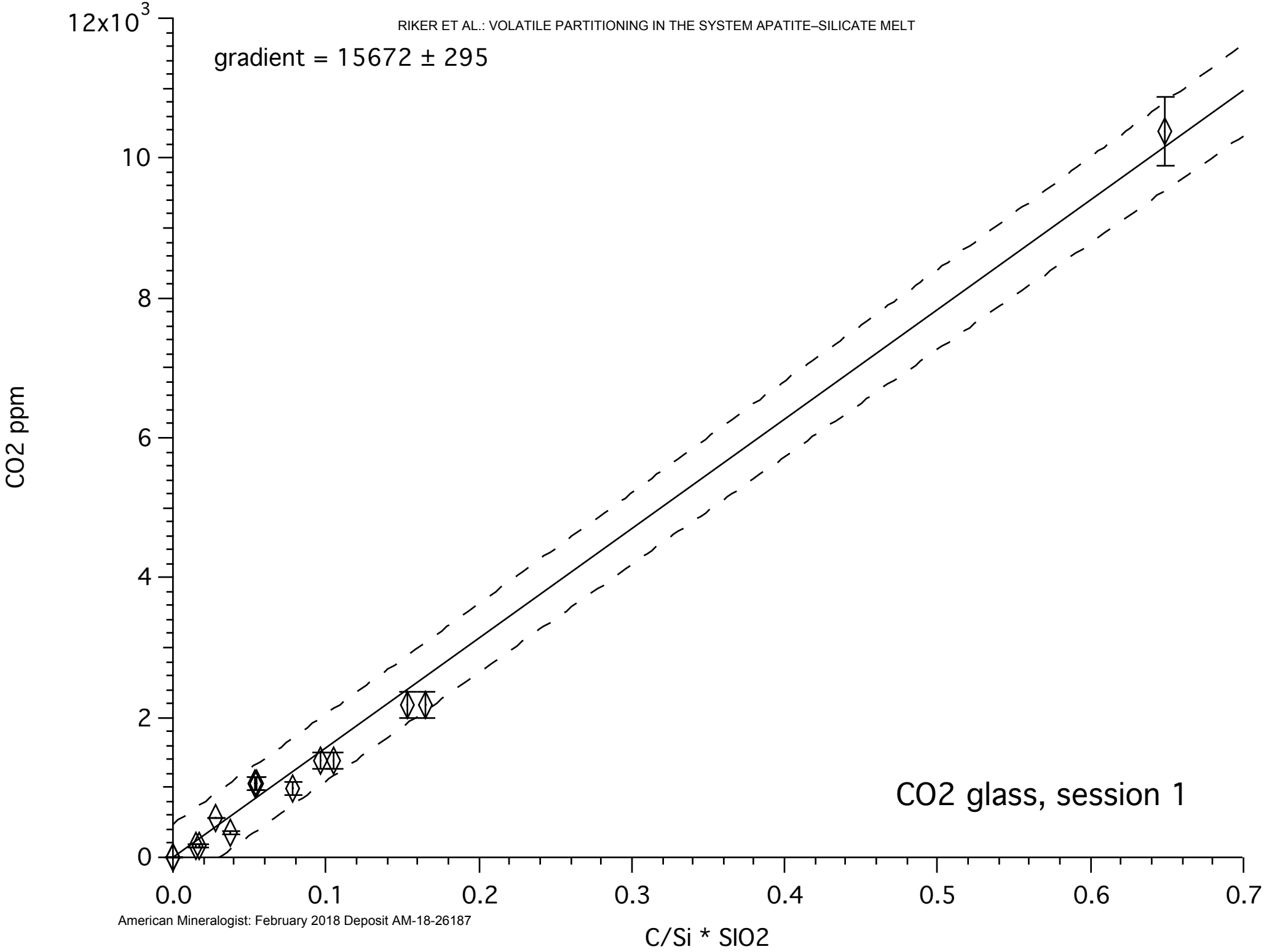

gradient = 2.0412e+06 ± 2.54e+04
CO2 ppm
C/Ca
4.5x10-3
CO2 apatite, session 1
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0



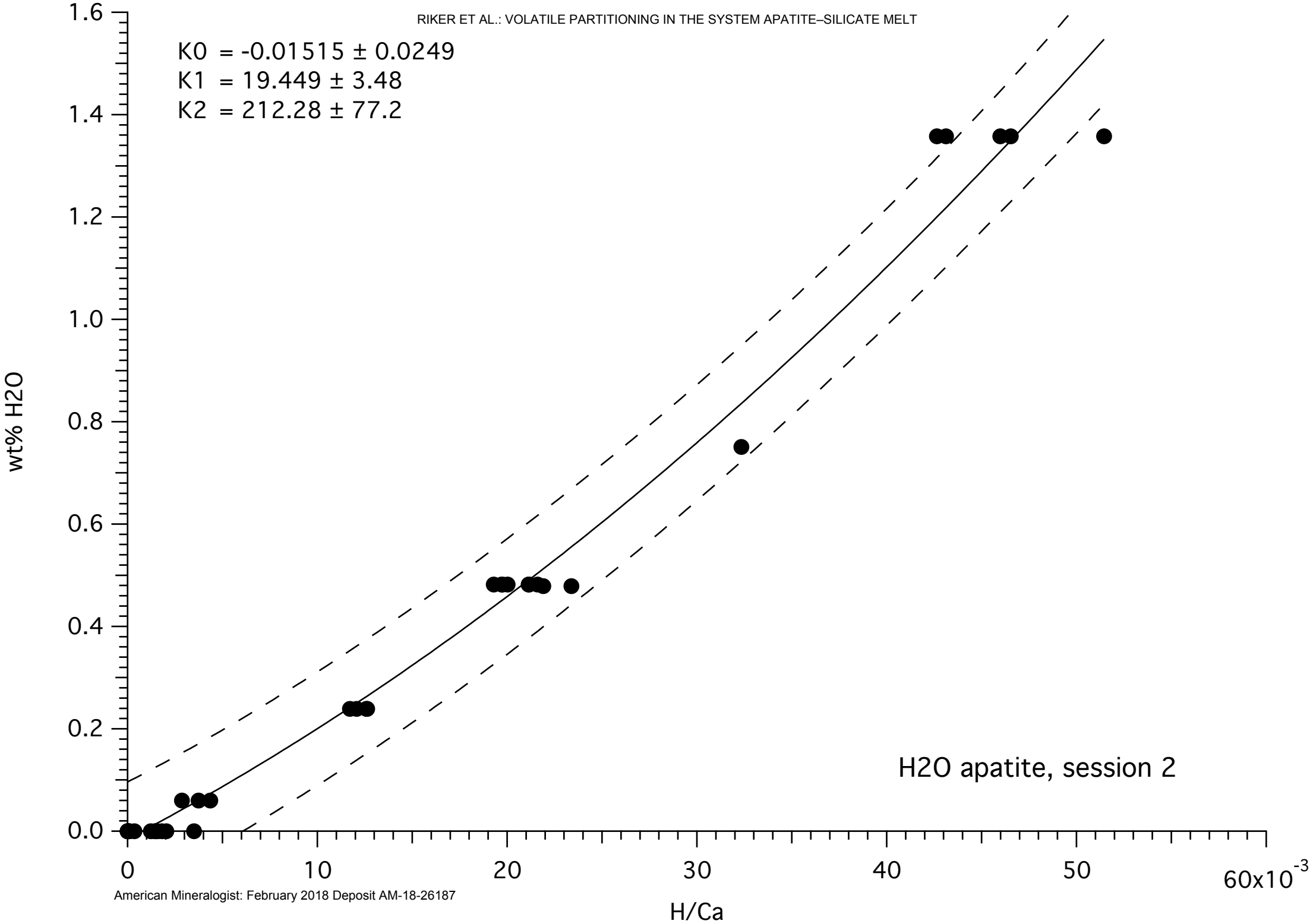

American Mineralogist: February 2018 Deposit AM-18-26187

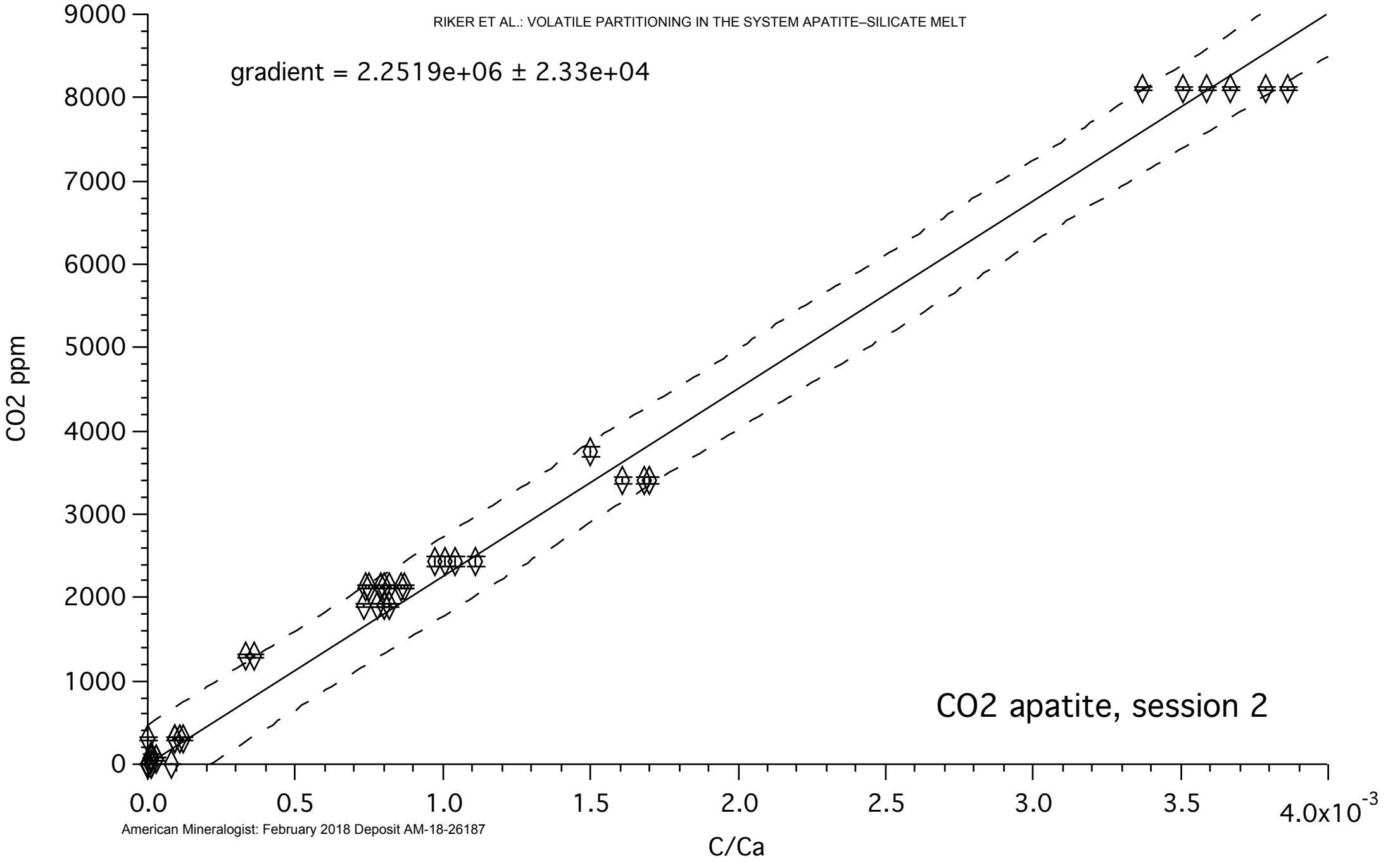

gradient = 100.49 ± 1.82
wt% Cl
Cl/Ca
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5x10-3
Cl apatite, session 1

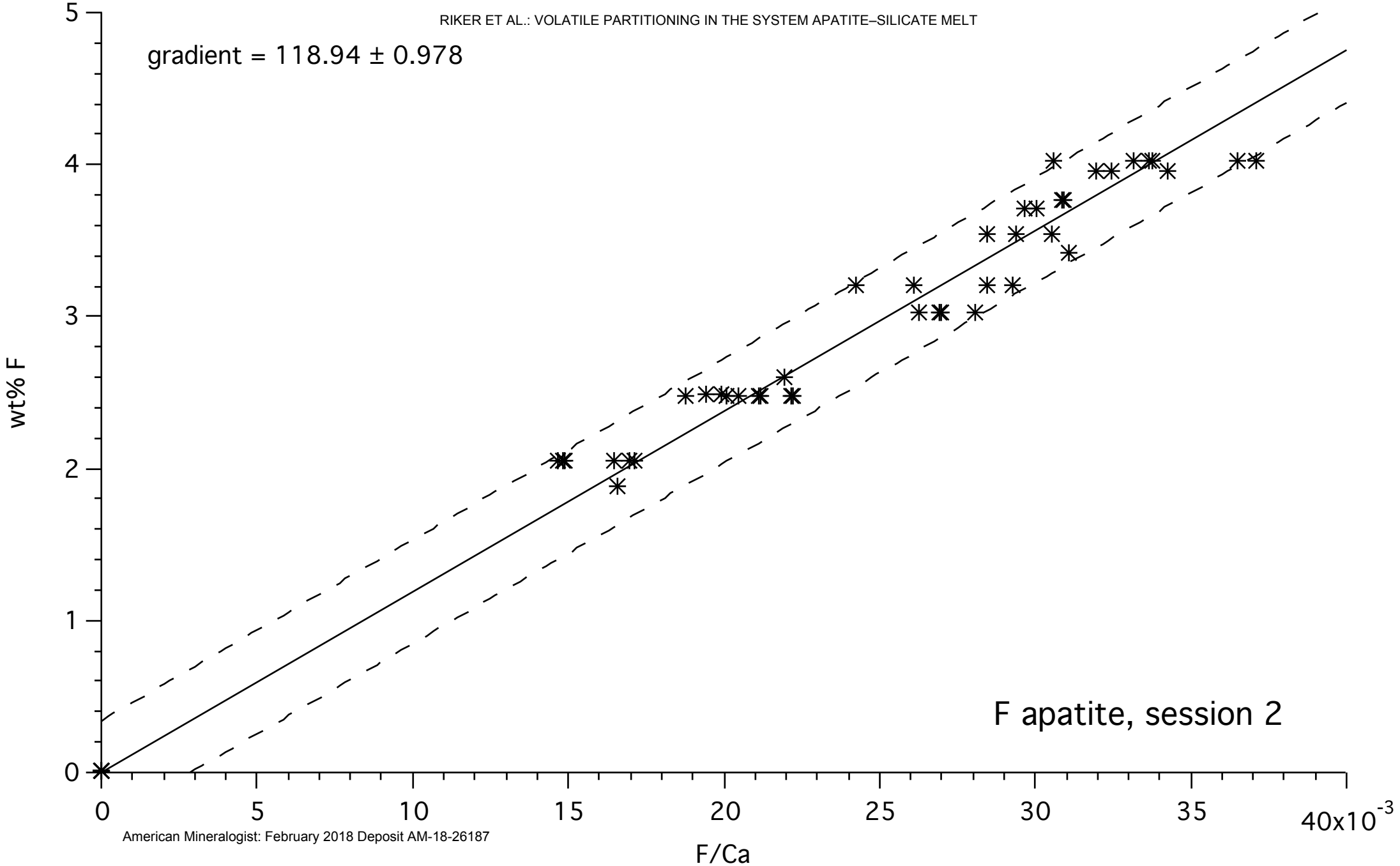

gradient = 2.7429 ± 0.0539
H2O glass, session 1
wt% H2O
H/Si
0
1
2
3
4
5
6
0.0
0.5
1.0
1.5
2.0
2.5

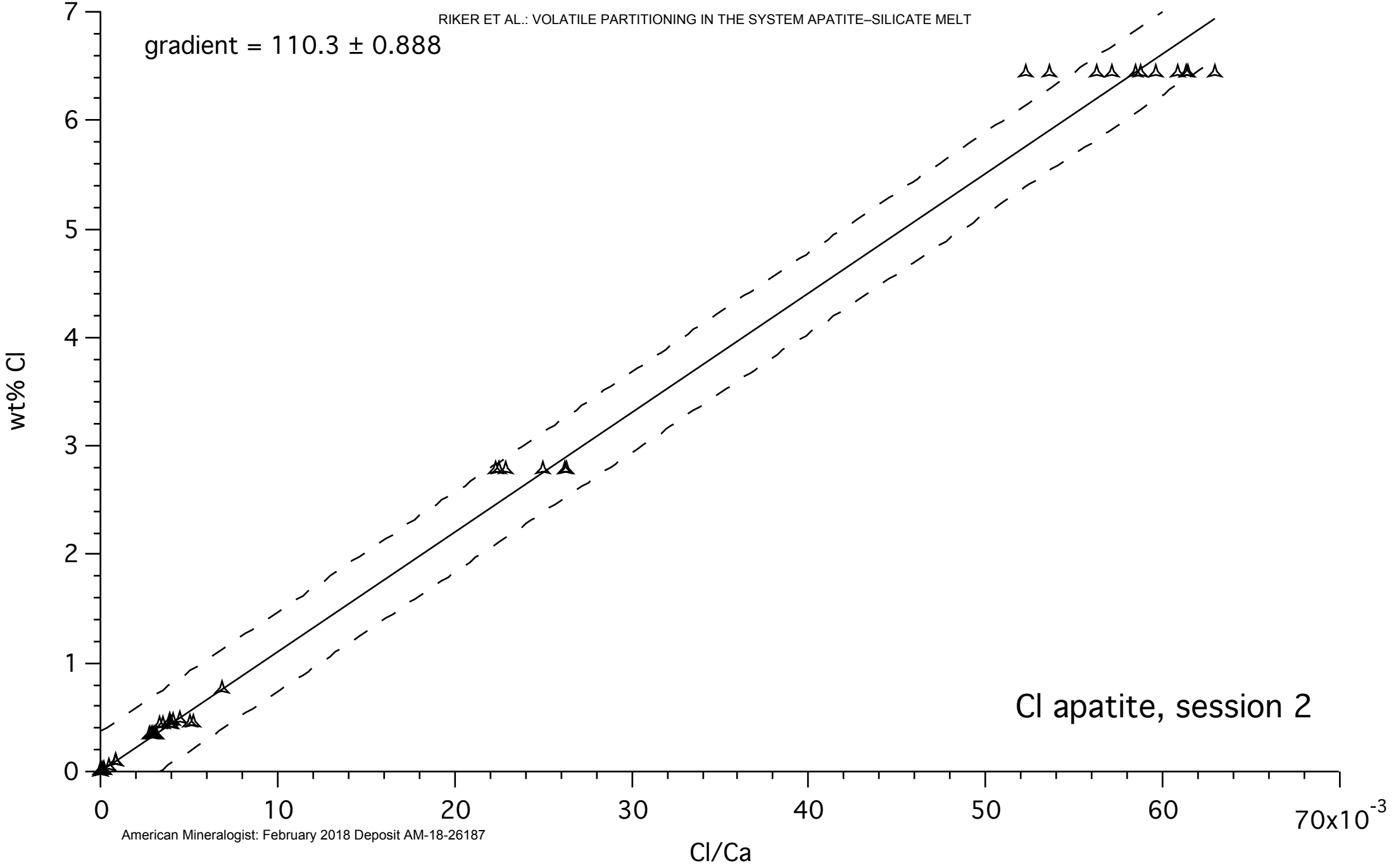

12x10^3
gradient = 15672 ± 295
10
8
6
4
2
0
CO2 ppm
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
C/Si * SIO2
CO2 glass, session 1

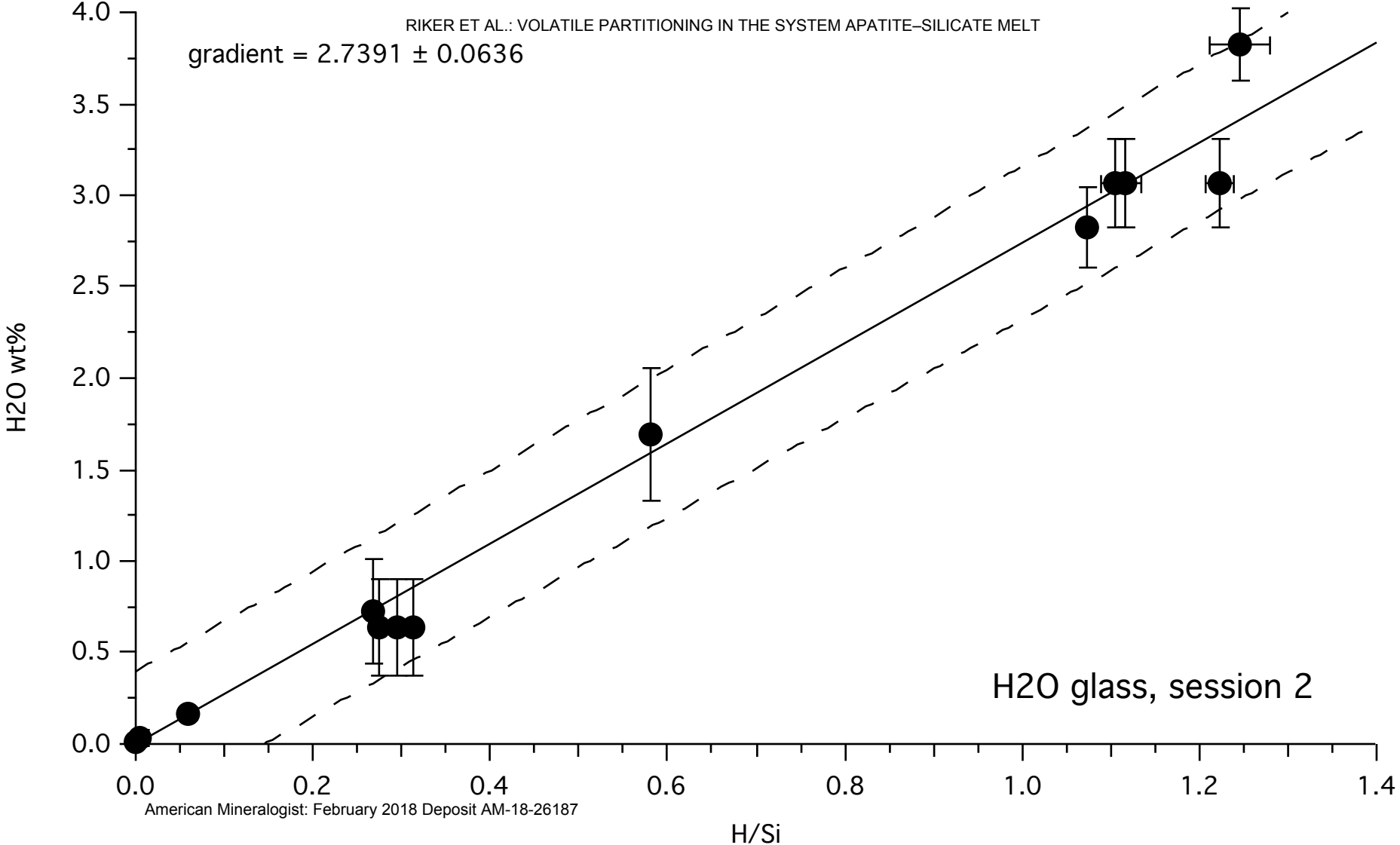
# Secondary ion mass spectrometry calibration lines for analytical session 2

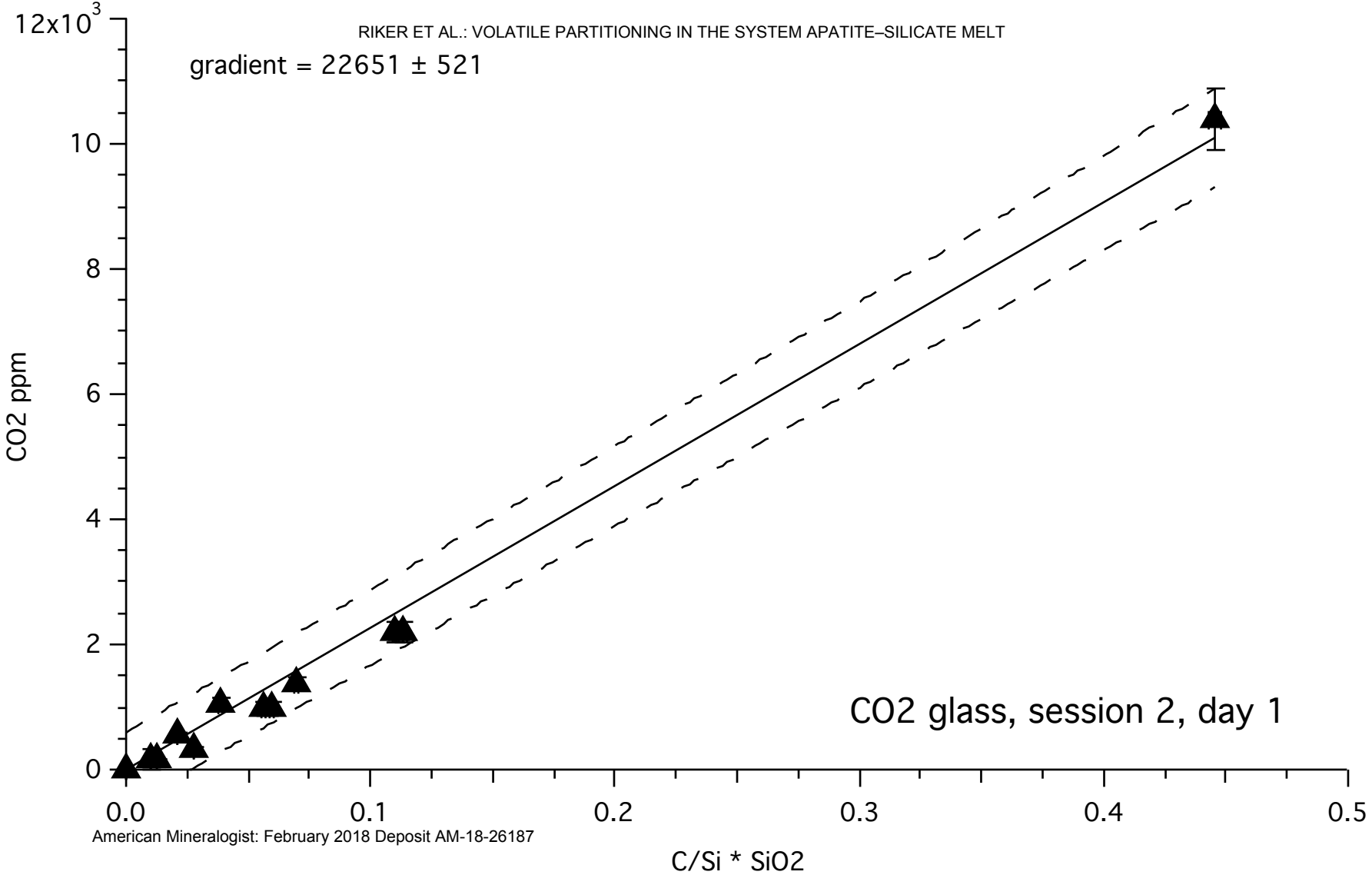

K0 = -0.01515 ± 0.0249
K1 = 19.449 ± 3.48
K2 = 212.28 ± 77.2
wt% H2O
H/Ca
60x10-3
H2O apatite, session 2
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
10
20
30
40
50

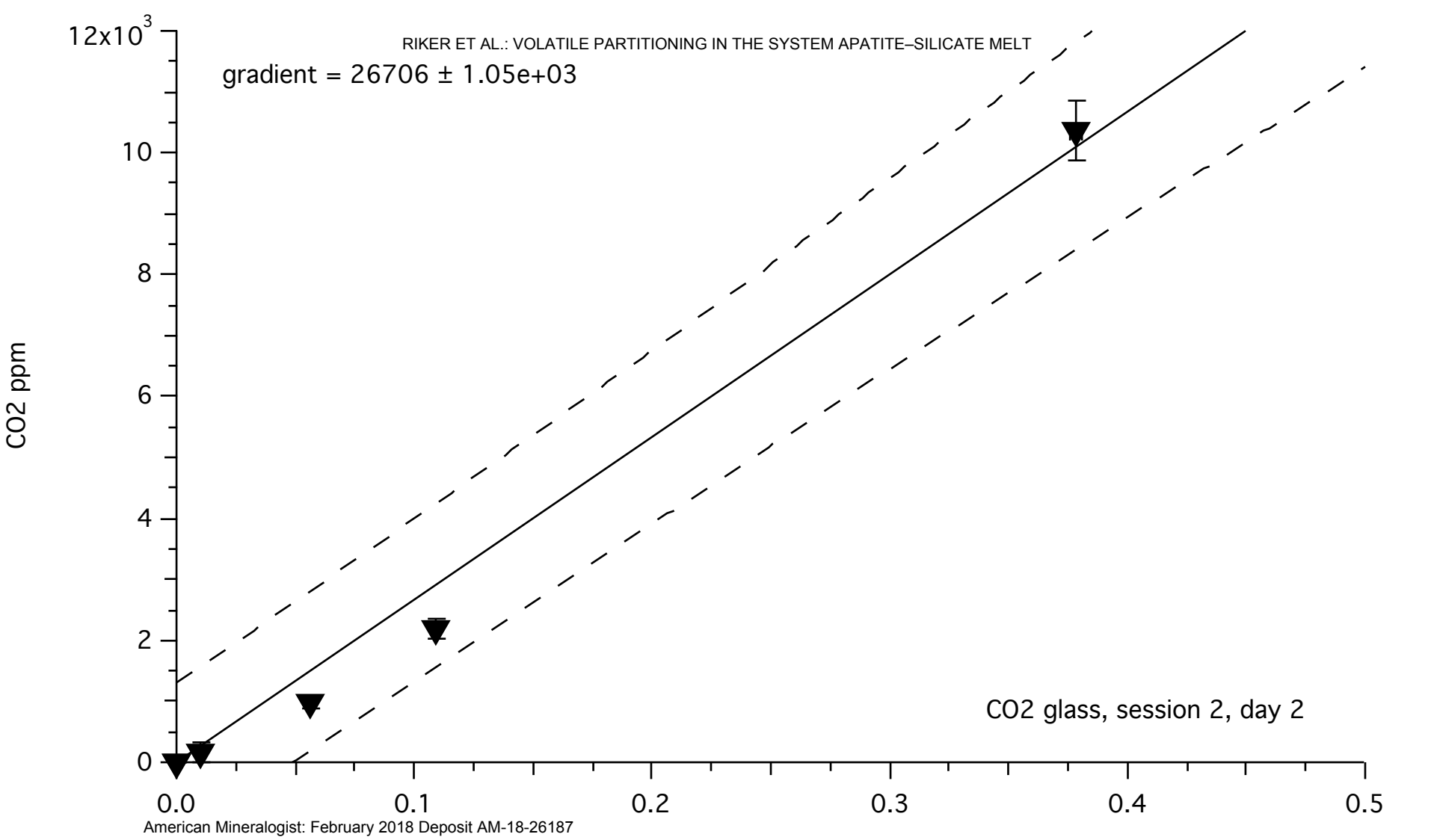

gradient = 2.2519e+06 ± 2.33e+04
CO2 apatite, session 2
CO2 ppm
C/Ca
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0x10-3


gradient = 118.94 ± 0.978
F apatite, session 2
wt% F
F/Ca
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40x10-3

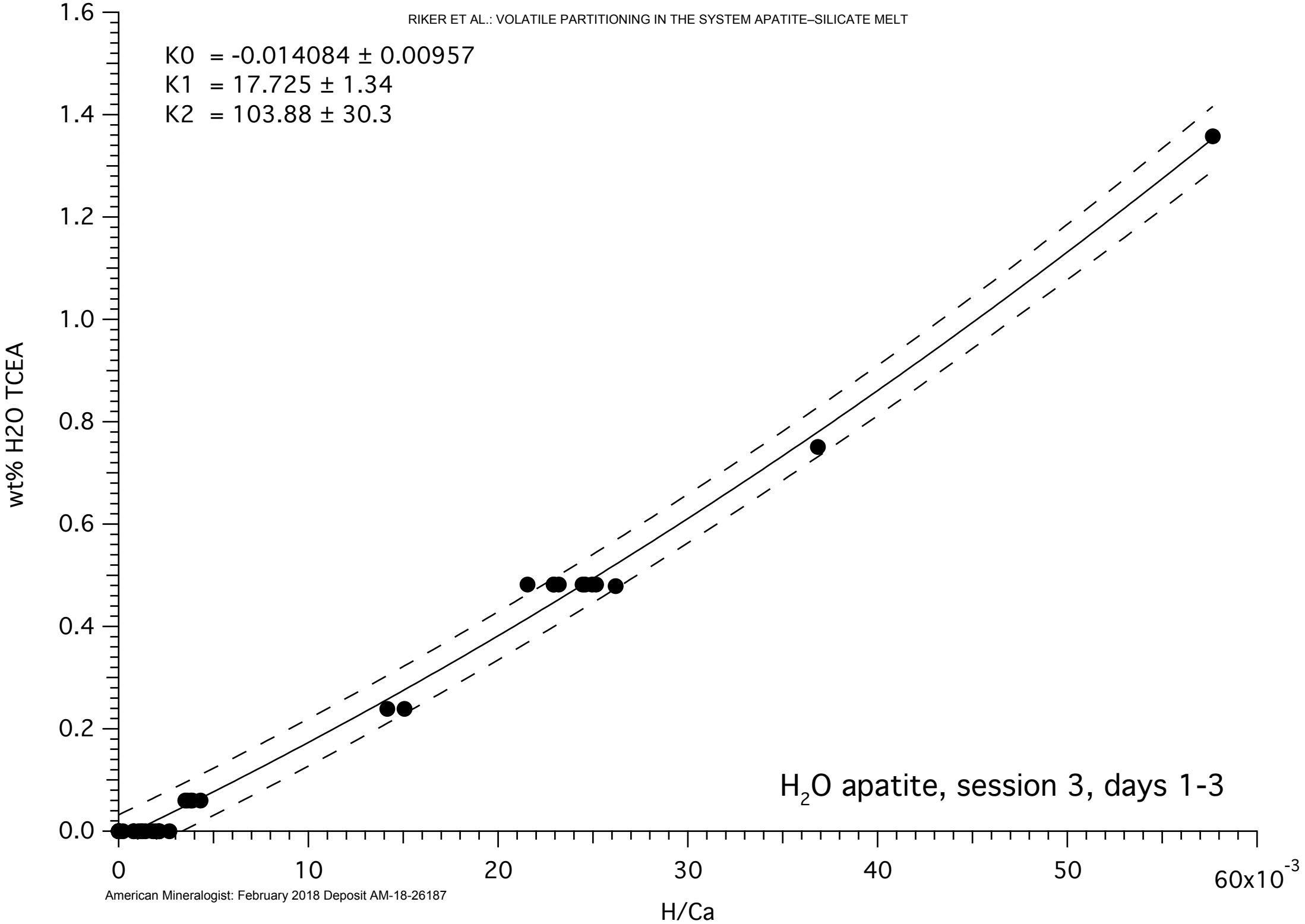

gradient = 110.3 ± 0.888
wt% Cl
Cl/Ca
70x10-3
Cl apatite, session 2
0
1
2
3
4
5
6
7
0
10
20
30
40
50
60

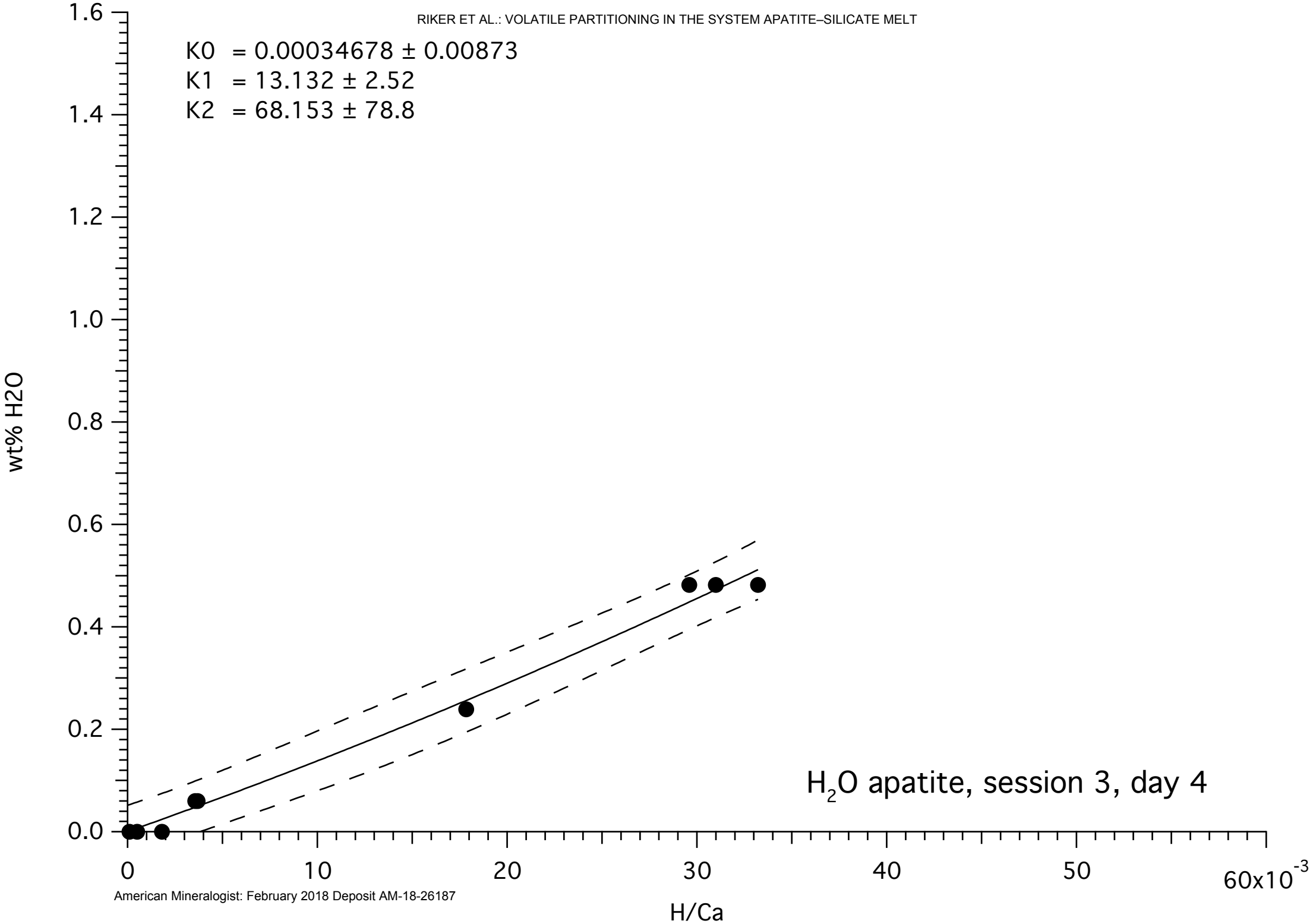

gradient = 2.7391 ± 0.0636
H2O wt%
H/Si
H2O glass, session 2
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4

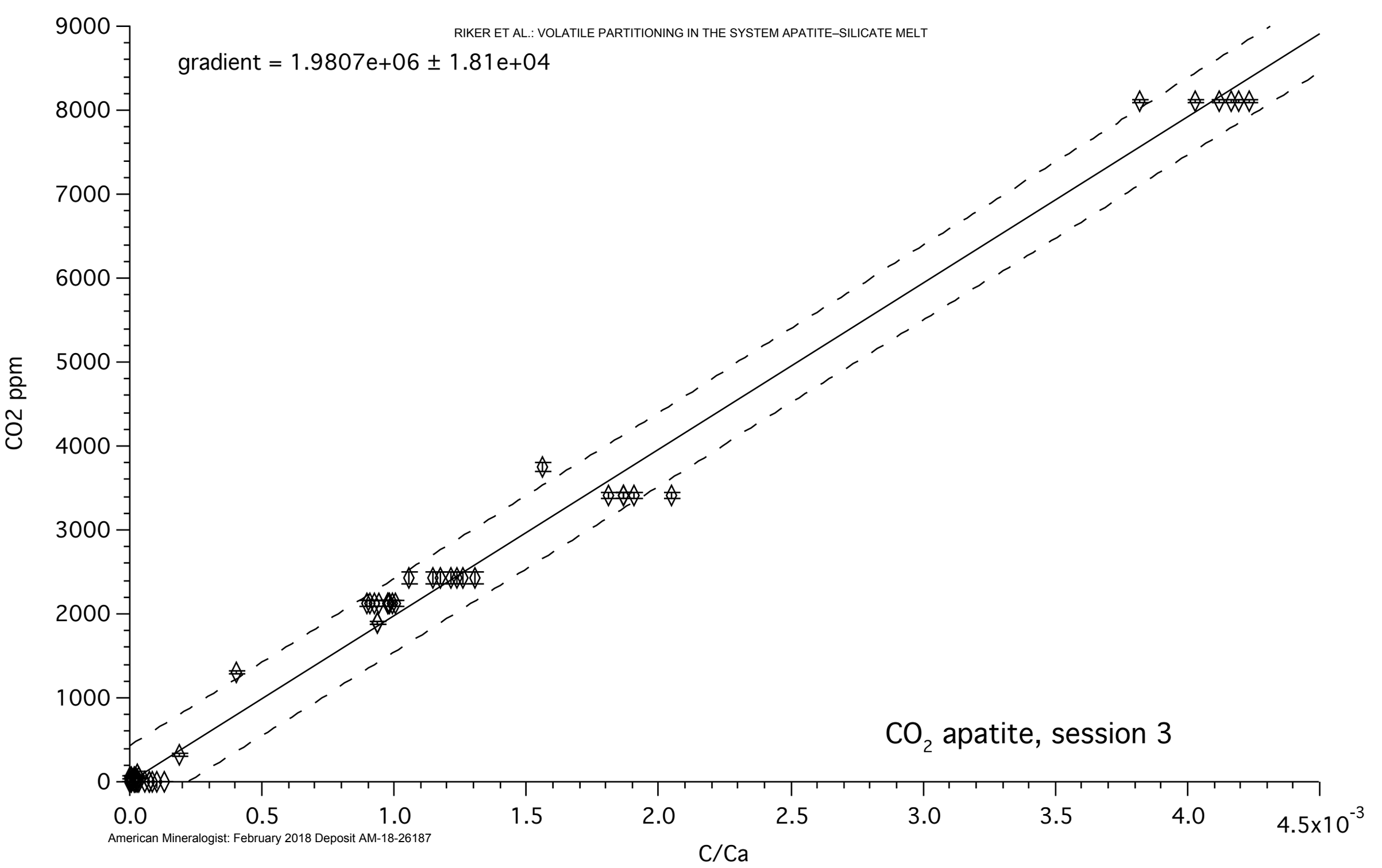

gradient = 22651 ± 521
12x10^3
10
8
6
4
2
0
CO2 ppm
0.0
0.1
0.2
0.3
0.4
0.5
C/Si * SiO2
CO2 glass, session 2, day 1

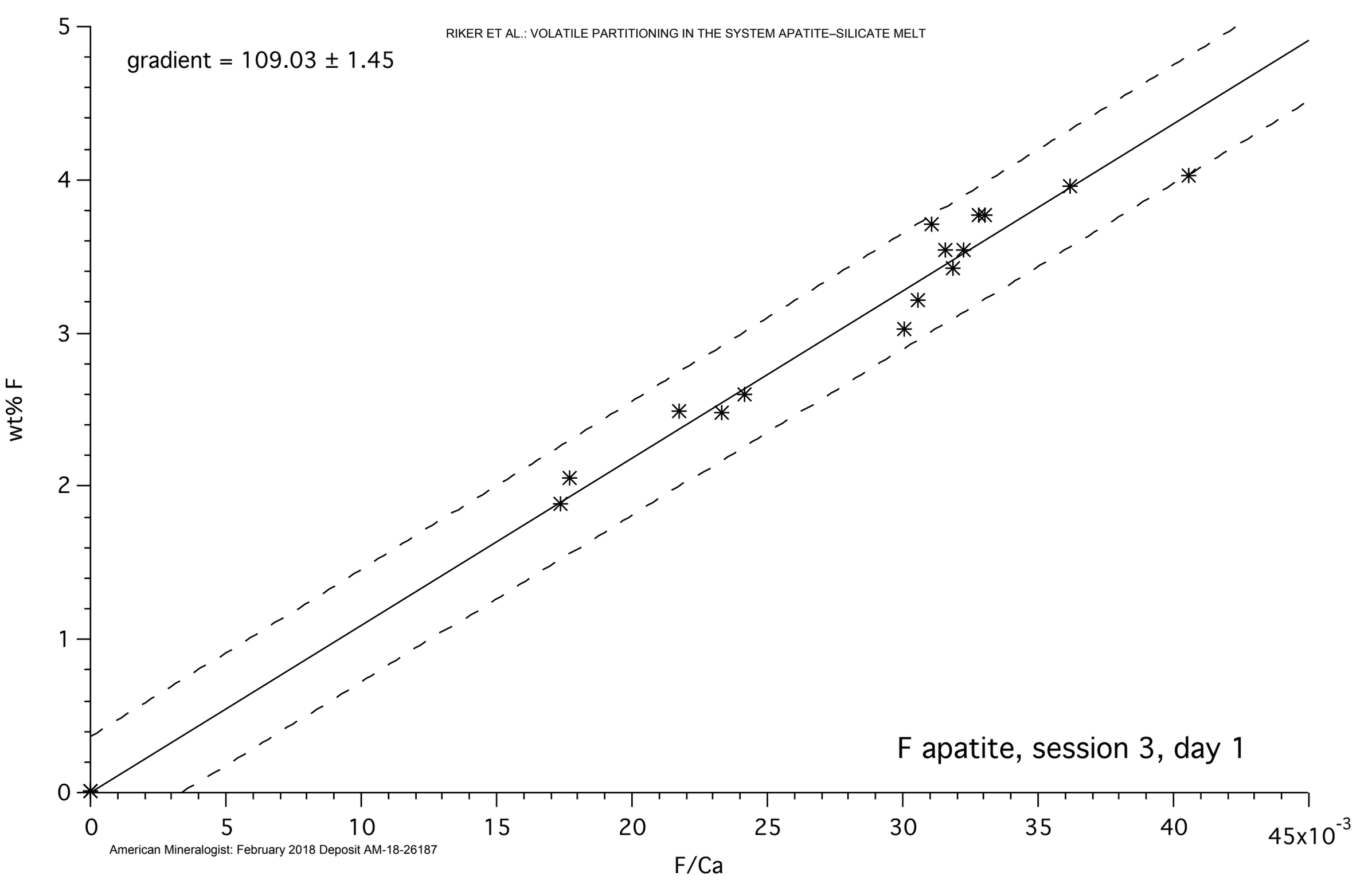

gradient = 26706 ± 1.05e+03
12x10^3
10
8
6
4
2
0
CO2 ppm
0.0
0.1
0.2
0.3
0.4
0.5
CO2 glass, session 2, day 2

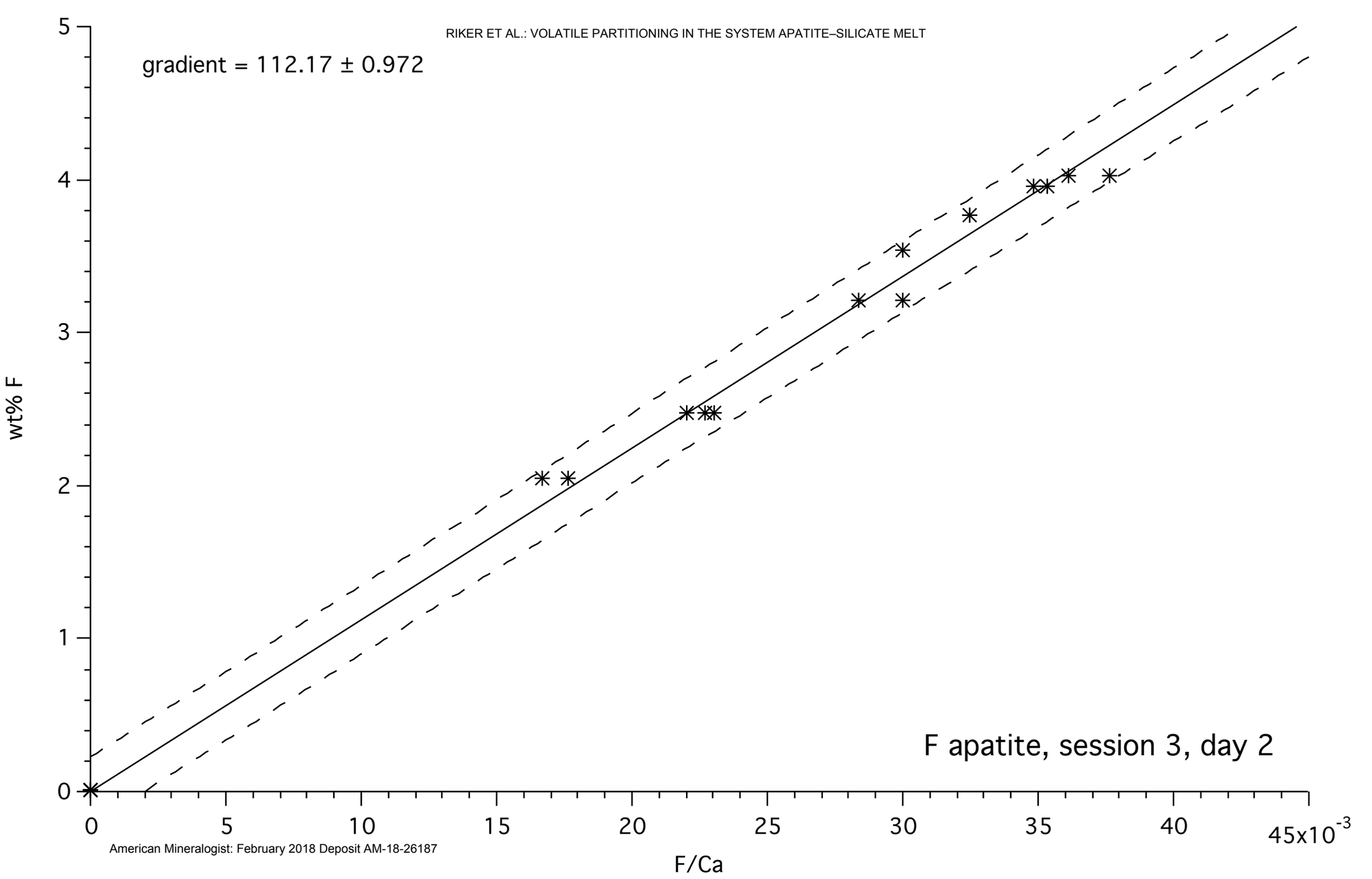
# Secondary ion mass spectrometry calibration lines for analytical session 3

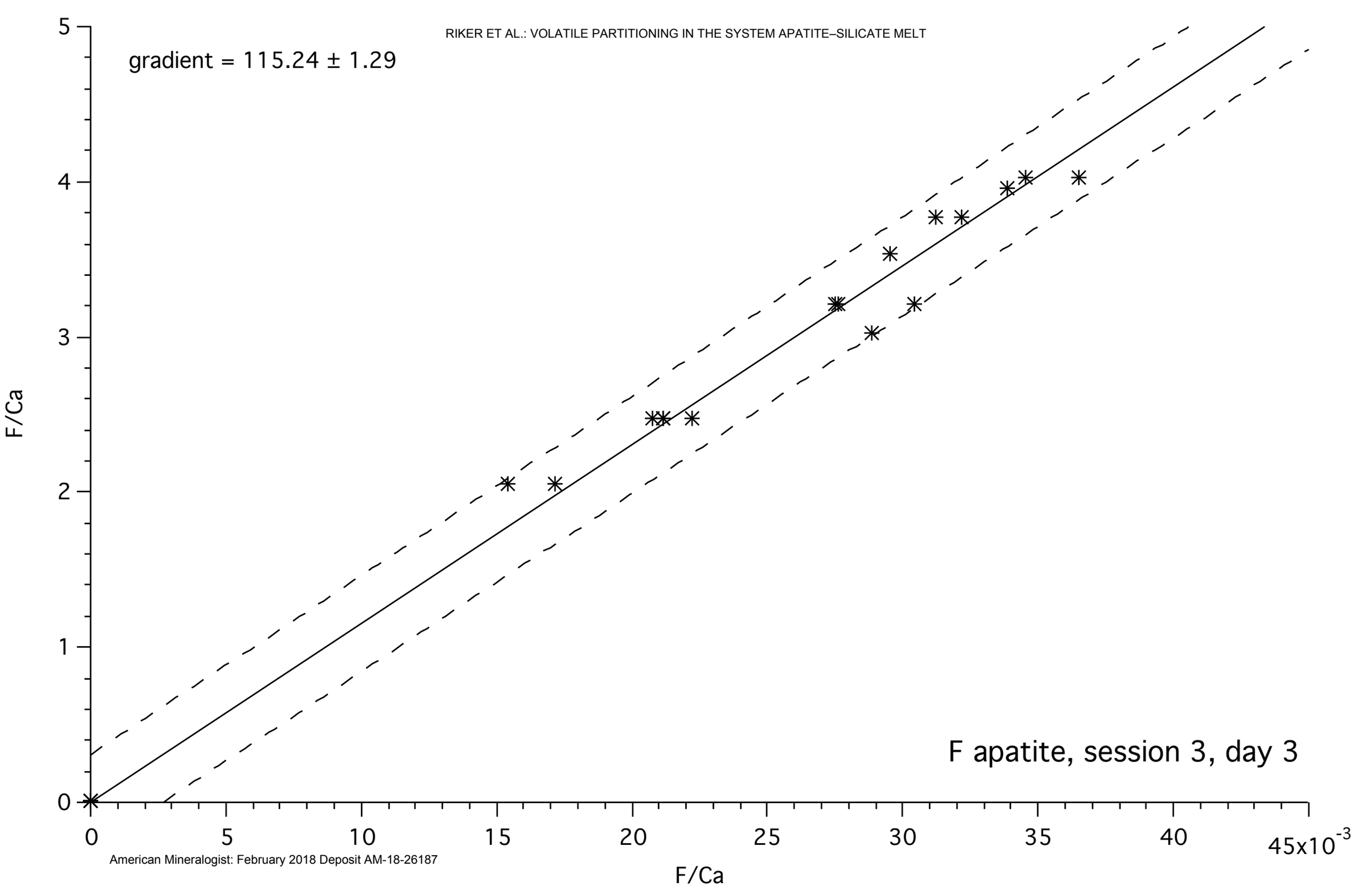

K0 = -0.014084 ± 0.00957
K1 = 17.725 ± 1.34
K2 = 103.88 ± 30.3
wt% H2O TCEA
H/Ca
60x10-3
H2O apatite, session 3, days 1-3
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
0
10
20
30
40
50

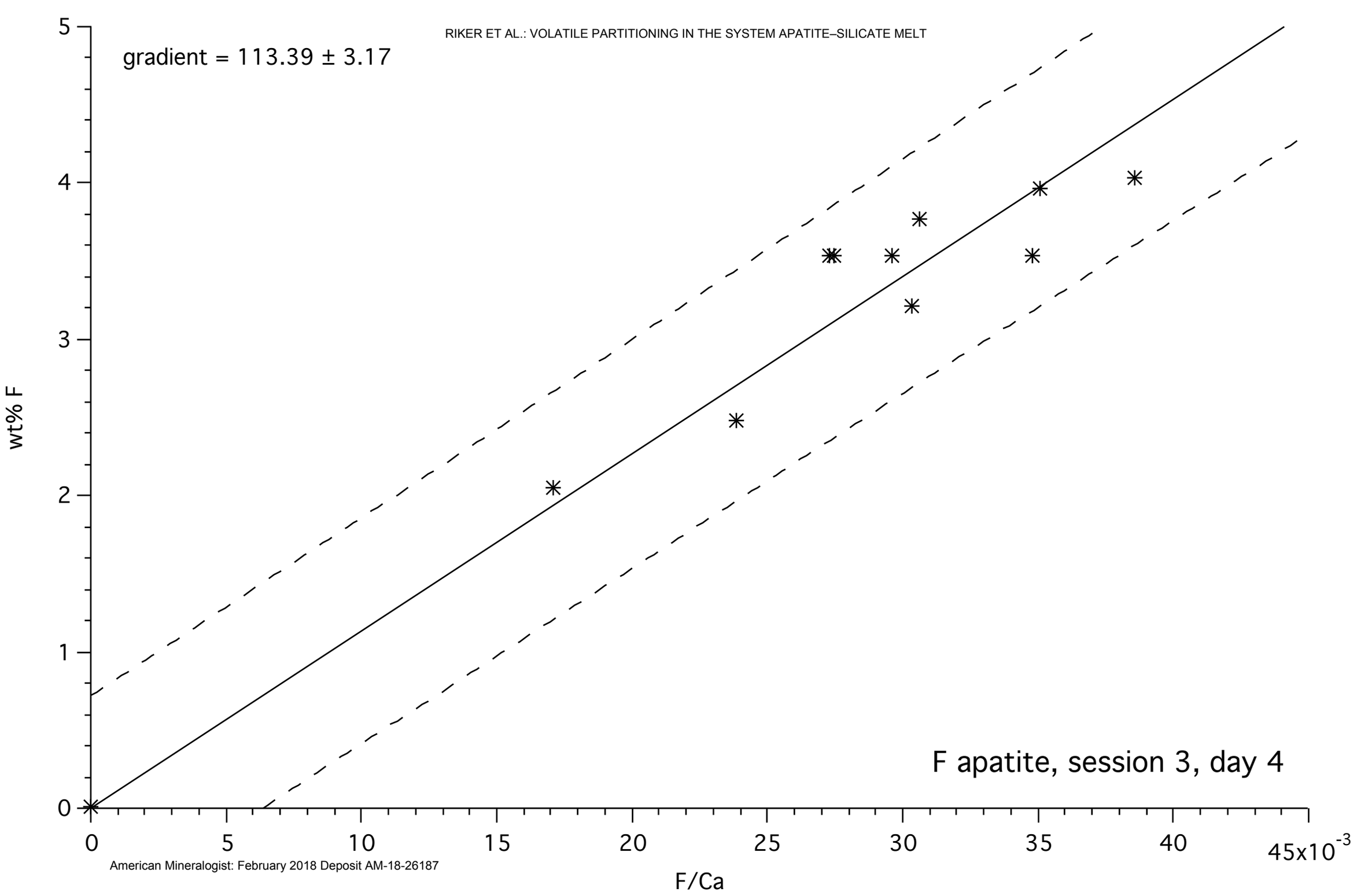

K0 = 0.00034678 ± 0.00873
K1 = 13.132 ± 2.52
K2 = 68.153 ± 78.8
wt% H2O
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0
10
20
30
40
50
60x10-3
H/Ca
H2O apatite, session 3, day 4

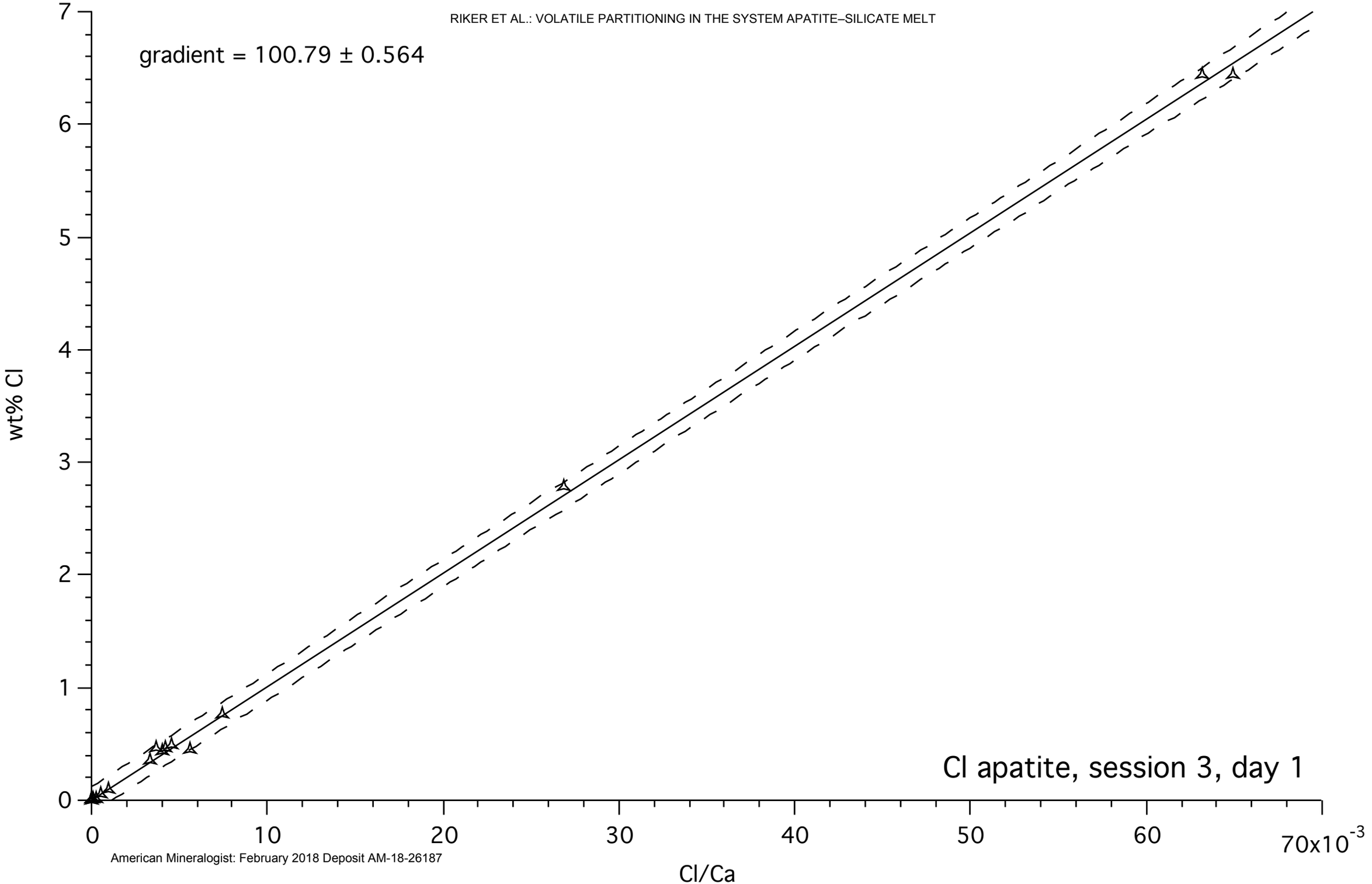

gradient = 1.9807e+06 ± 1.81e+04
CO2 ppm
C/Ca
4.5x10-3
CO2 apatite, session 3
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0

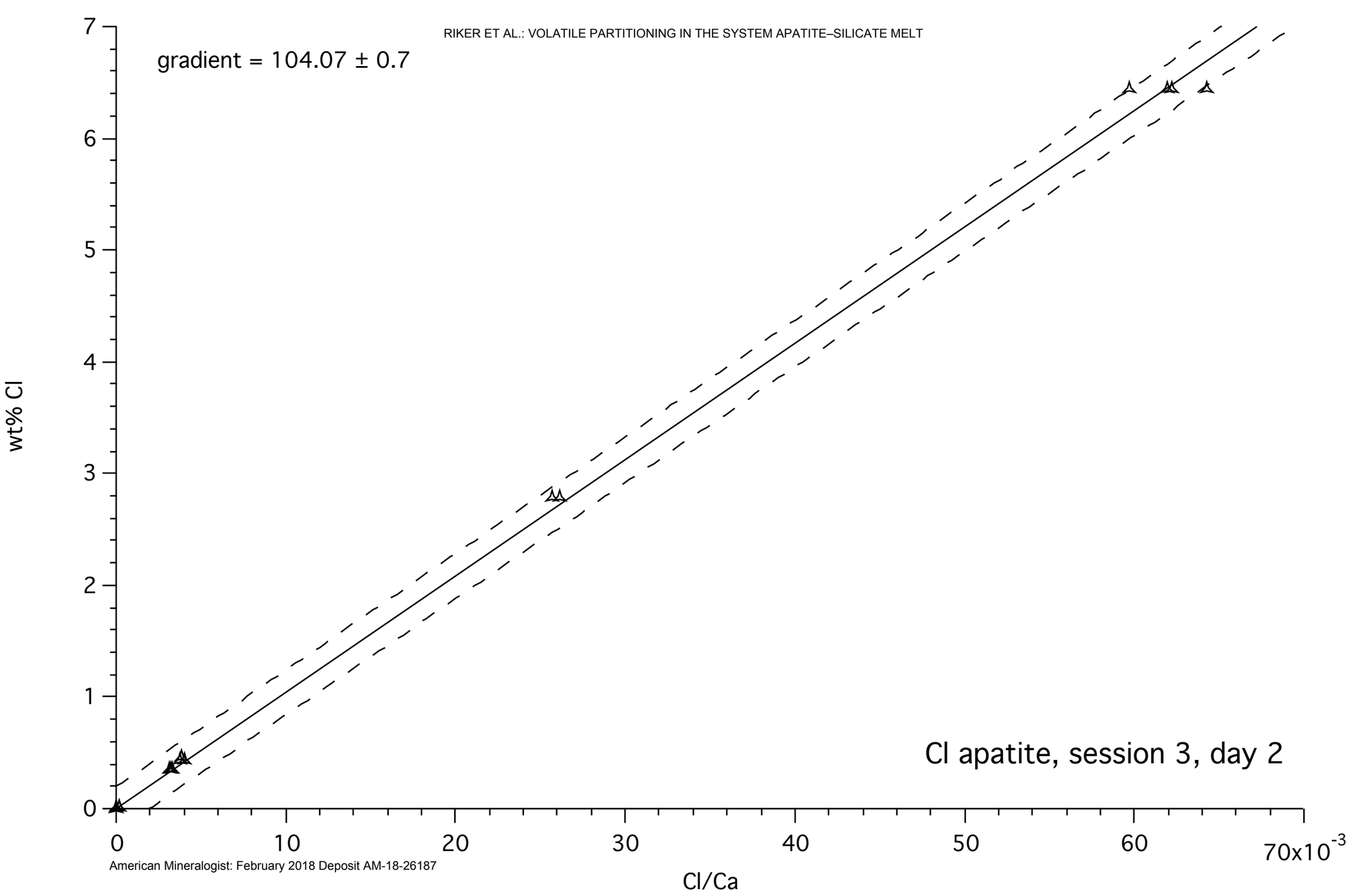

gradient = 109.03 ± 1.45
wt% F
F/Ca
45x10-3
F apatite, session 3, day 1
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40

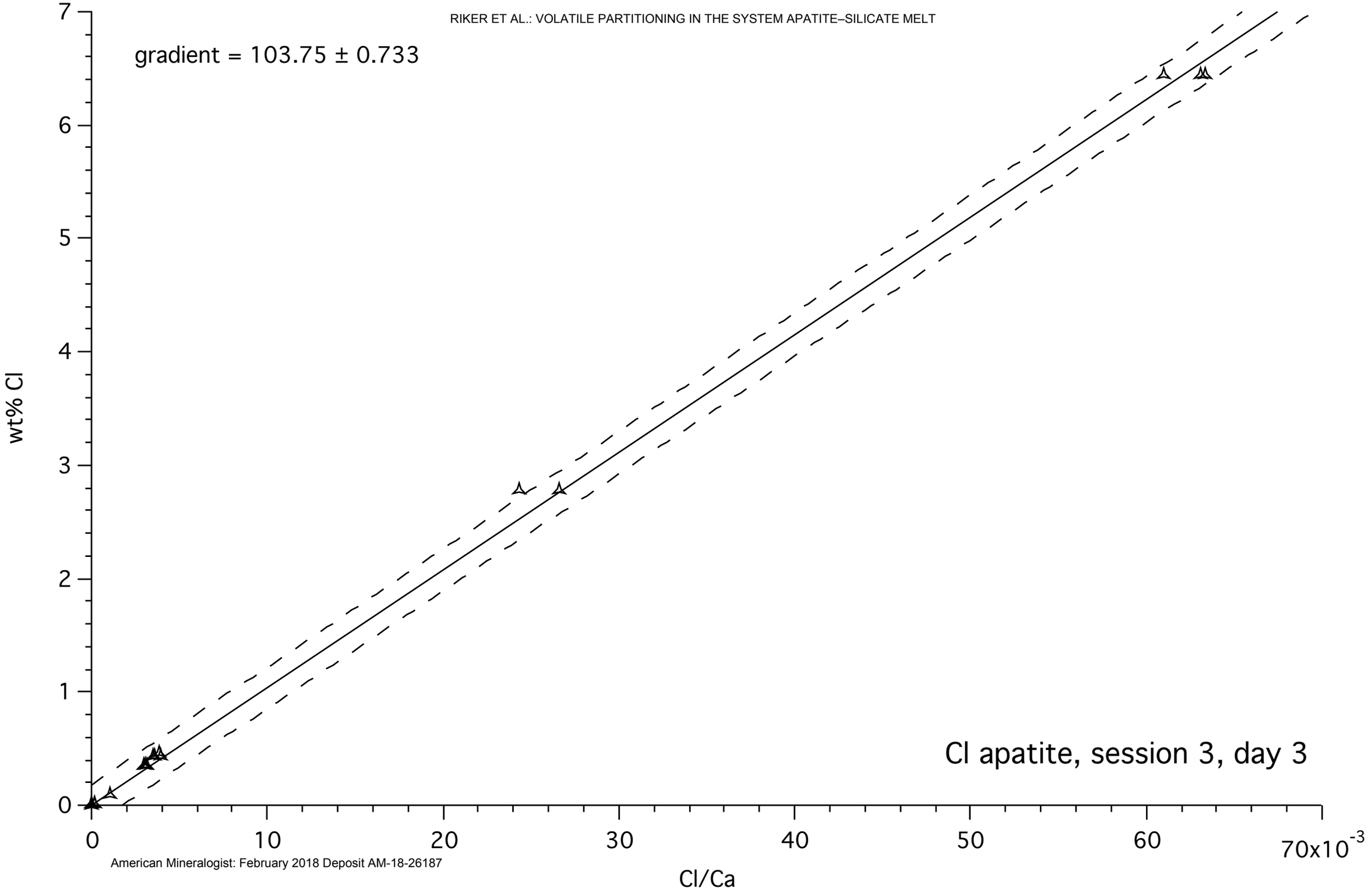

gradient = 112.17 ± 0.972
F apatite, session 3, day 2
wt% F
F/Ca
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40
45x10-3

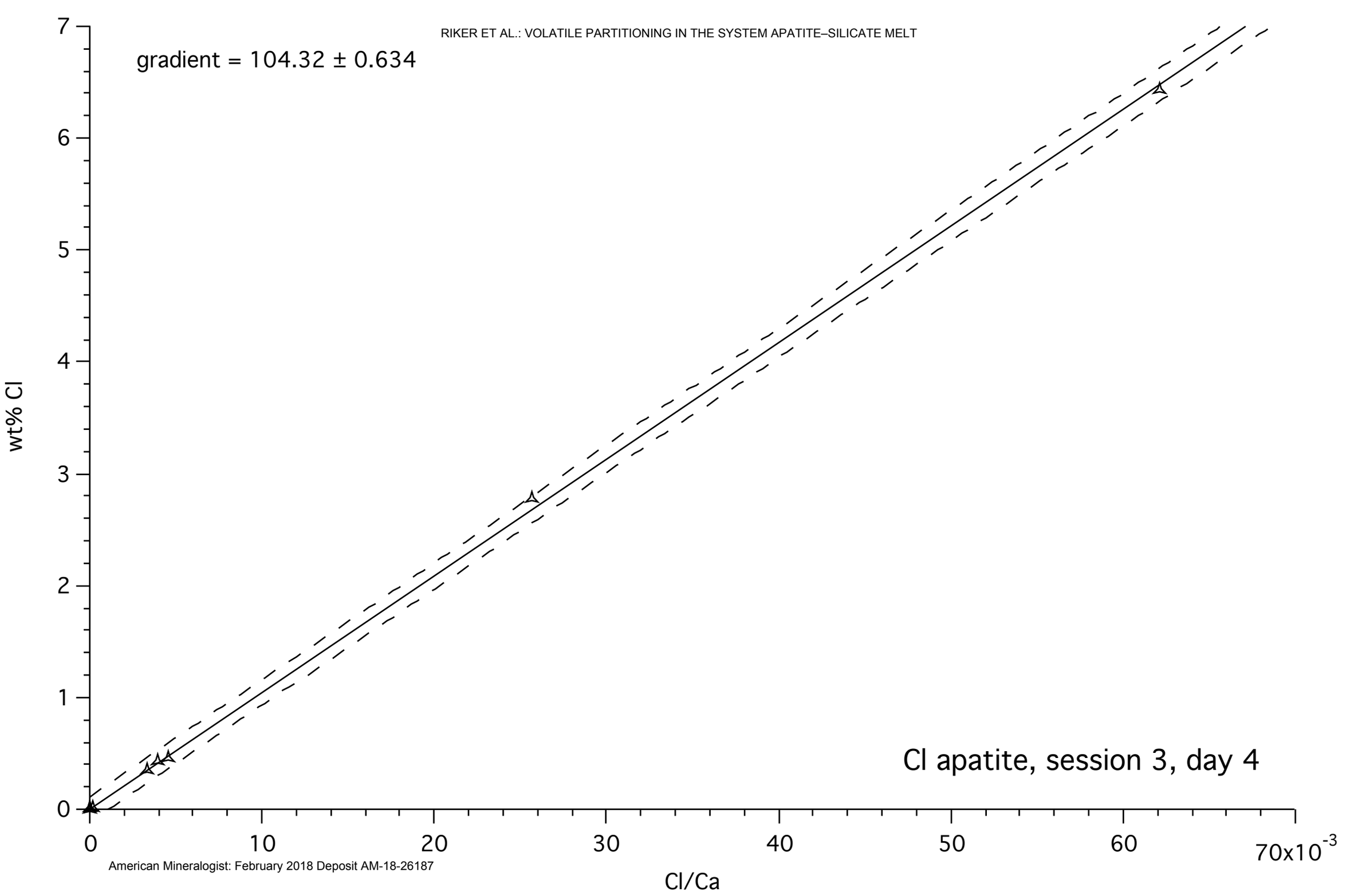

gradient = 115.24 ± 1.29
F apatite, session 3, day 3
F/Ca
F/Ca
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40
45x10-3

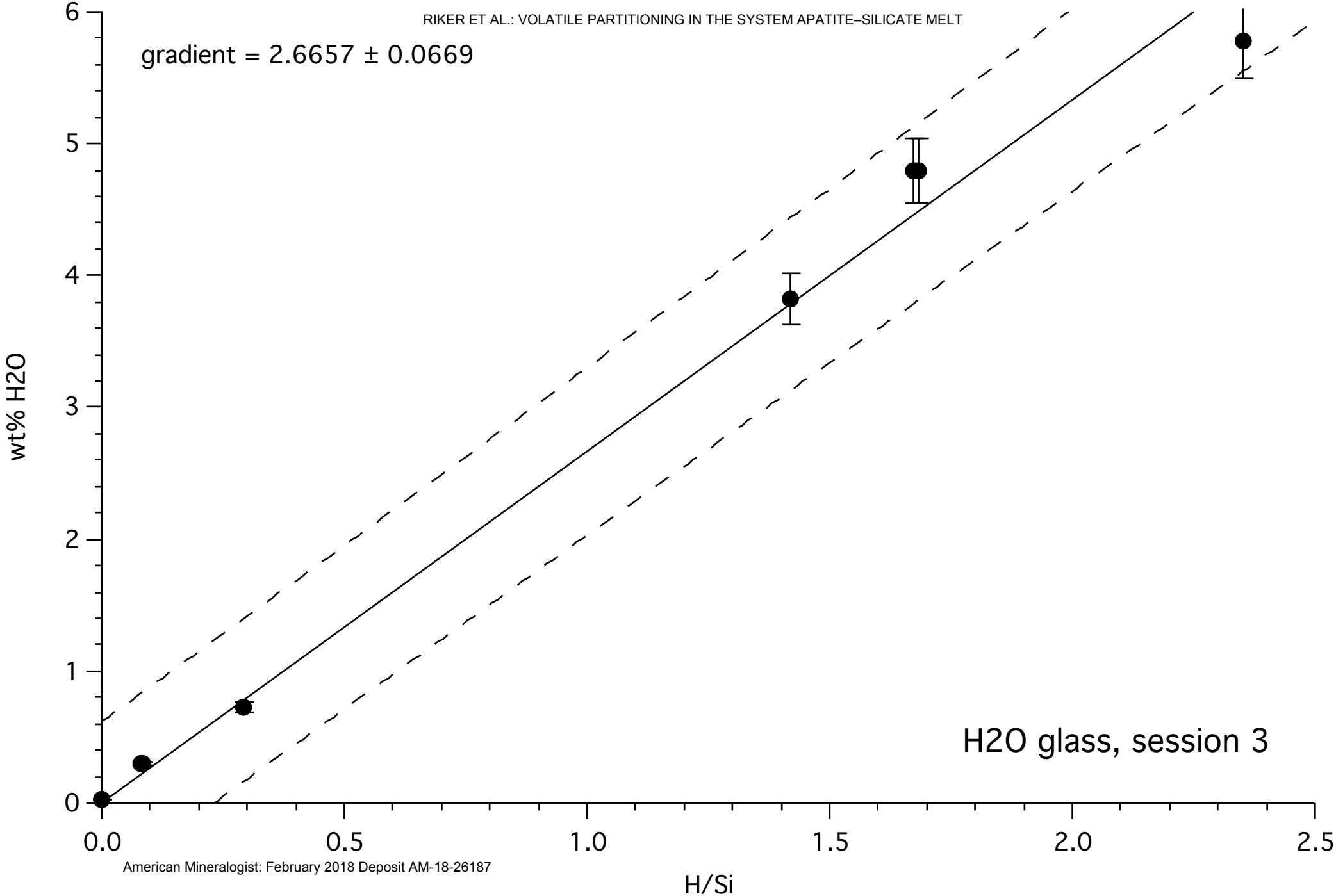

gradient = 113.39 ± 3.17
F apatite, session 3, day 4
wt% F
F/Ca
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40
45x10-3

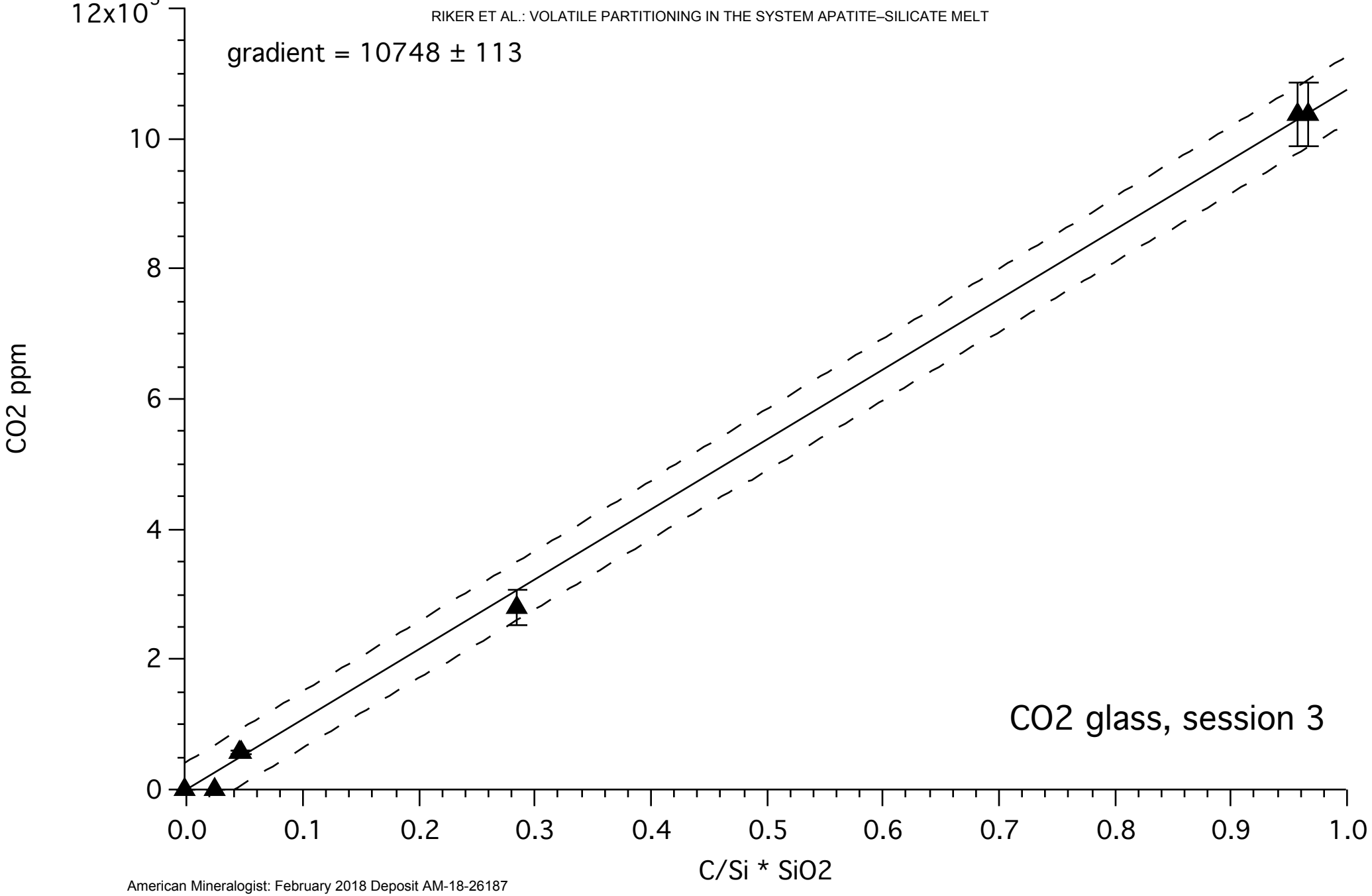

gradient = 100.79 ± 0.564
wt% Cl
Cl/Ca
70x10-3
Cl apatite, session 3, day 1
0
1
2
3
4
5
6
7
0
10
20
30
40
50
60


gradient = 104.07 ± 0.7
wt% Cl
Cl/Ca
70x10-3
Cl apatite, session 3, day 2
0
1
2
3
4
5
6
7
0
10
20
30
40
50
60


gradient = 103.75 ± 0.733
wt% Cl
Cl/Ca
70x10-3
Cl apatite, session 3, day 3
0
1
2
3
4
5
6
7
0
10
20
30
40
50
60


gradient = 104.32 ± 0.634
wt% Cl
Cl/Ca
0
1
2
3
4
5
6
7
0
10
20
30
40
50
60
70x10-3
Cl apatite, session 3, day 4


gradient = 2.6657 ± 0.0669
wt% H2O
H/Si
H2O glass, session 3
0
1
2
3
4
5
6
0.0
0.5
1.0
1.5
2.0
2.5


12x10^3
gradient = 10748 ± 113
10
8
6
4
2
0
CO2 ppm
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
C/Si * SiO2
CO2 glass, session 3