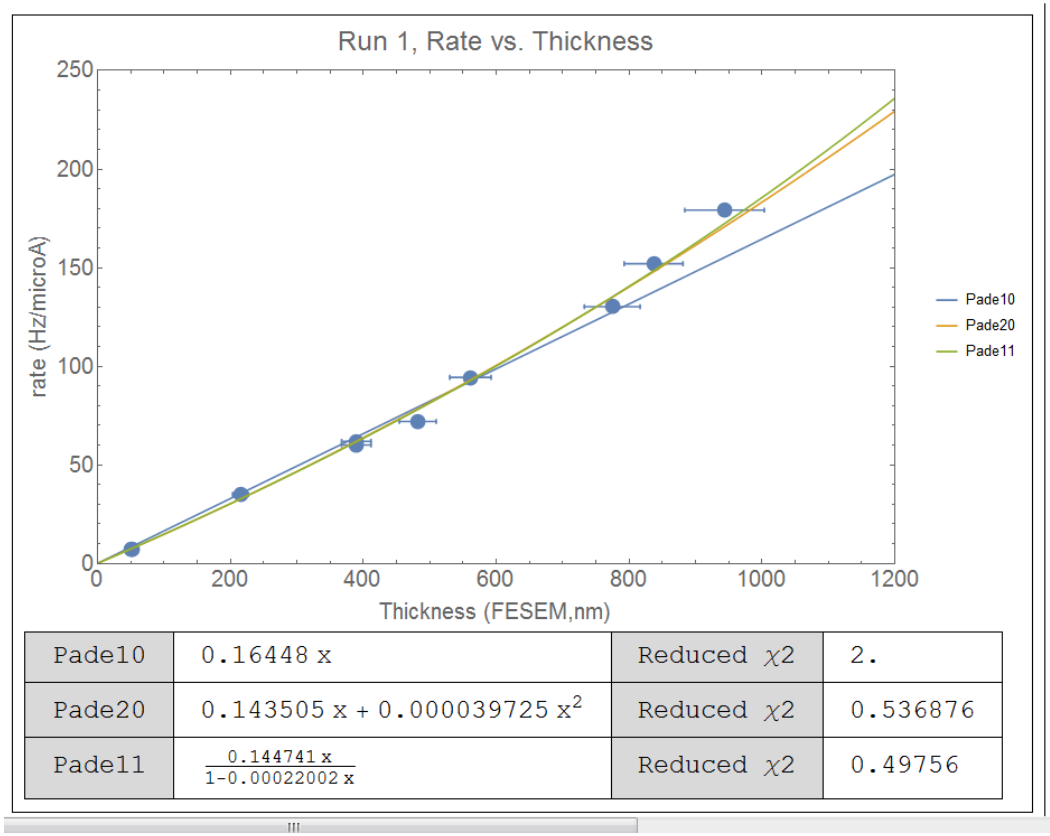
Rate vs. Thickness

Jan 18, 2017

Mathematica run 1 RvT



Pade10	$0.16448\,x$	Reduced $\chi 2$	2.
Pade20	$0.143505\,x + 0.000039725\,x^2$	Reduced $\chi 2$	0.536876
Pade11	$\frac{0.144741\,x}{1-0.00022002\,x}$	Reduced $\chi 2$	0.49756

In[451]:= `PlotPade10[{"ParameterTable"}]`

Out[451]=

	Estimate	Standard Error	t- Statistic	P- Value
a1	0.16448	0.00442695	37.1541	3.67502×10^{-11}

In[452]:= `PlotPade20[{"ParameterTable"}]`

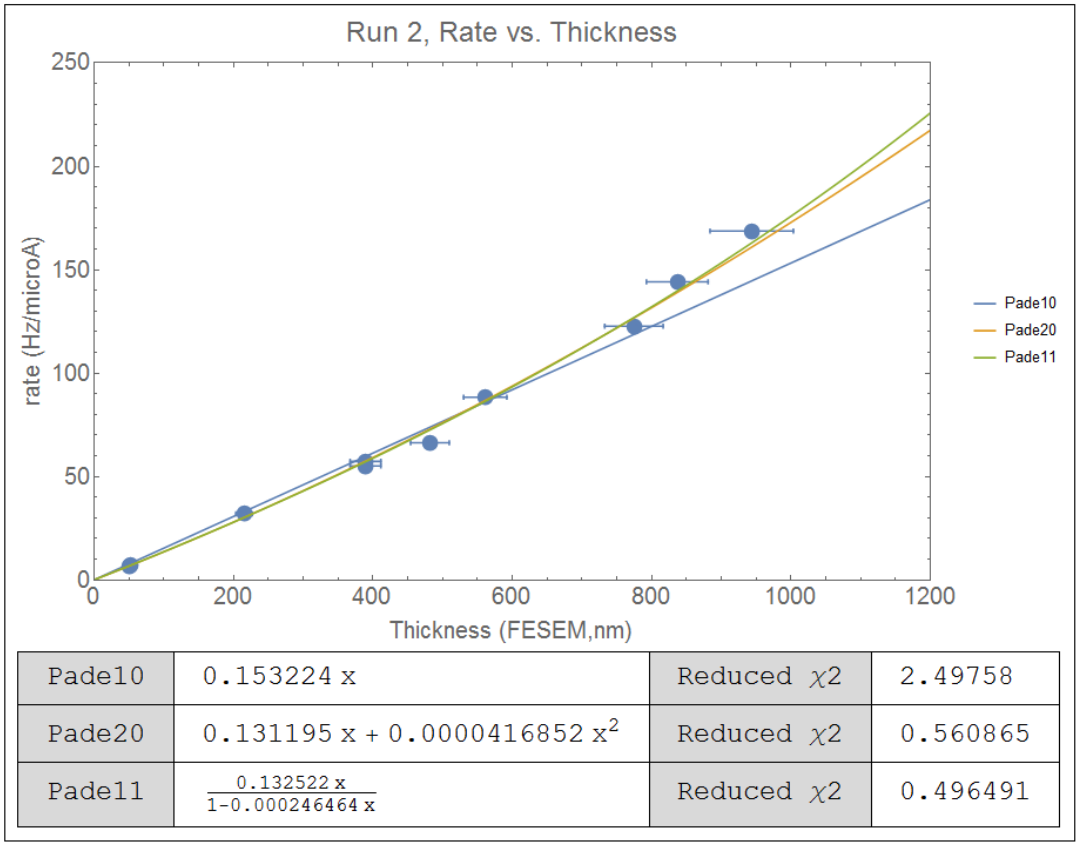
Out[452]=

	Estimate	Standard Error	t- Statistic	P- Value
a1	0.143505	0.0051216	28.0195	2.84241×10^{-9}
a2	0.000039725	9.56285×10^{-6}	4.1541	0.00319095

In[453]:= `PlotPade11[{"ParameterTable"}]`

Out[453]=

	Estimate	Standard Error	t- Statistic	P- Value
a1	0.144741	0.00431972	33.507	6.87112×10^{-10}
b1	−0.00022002	0.0000448052	−4.91059	0.00117791



Pade10	$0.153224\,x$	Reduced $\chi 2$	2.49758
Pade20	$0.131195\,x + 0.0000416852\,x^2$	Reduced $\chi 2$	0.560865
Pade11	$\frac{0.132522\,x}{1-0.000246464\,x}$	Reduced $\chi 2$	0.496491

In[499]:= `PlotPade10[{"ParameterTable"}]`

Out[499]=

	Estimate	Standard Error	t- Statistic	P- Value
a1	0.153224	0.00460866	33.2469	9.92428×10^{-11}

In[500]:= `PlotPade20[{"ParameterTable"}]`

Out[500]=

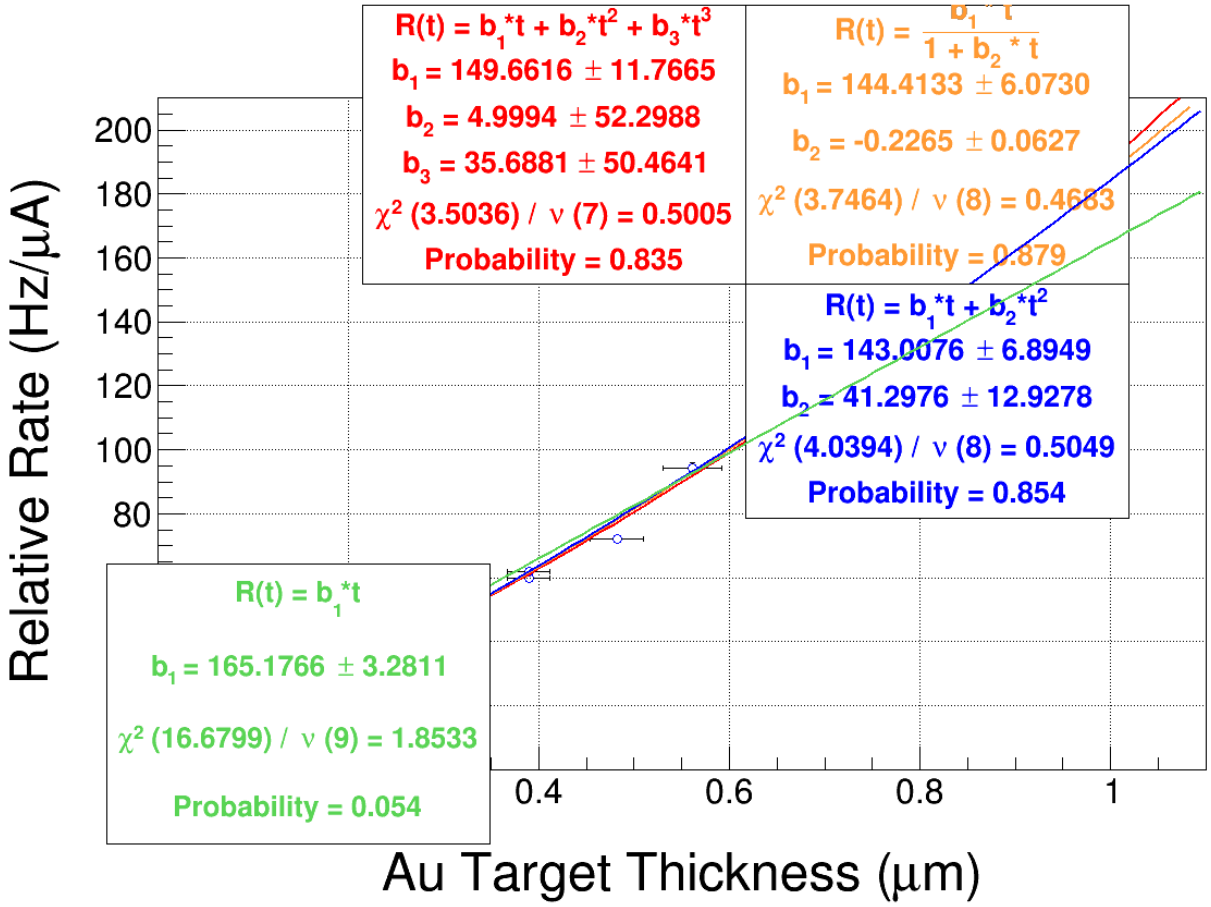
	Estimate	Standard Error	t- Statistic	P- Value
a1	0.131195	0.00486848	26.9478	3.8717×10^{-9}
a2	0.0000416852	9.19831×10^{-6}	4.53183	0.00191973

In[501]:= `PlotPade11[{"ParameterTable"}]`

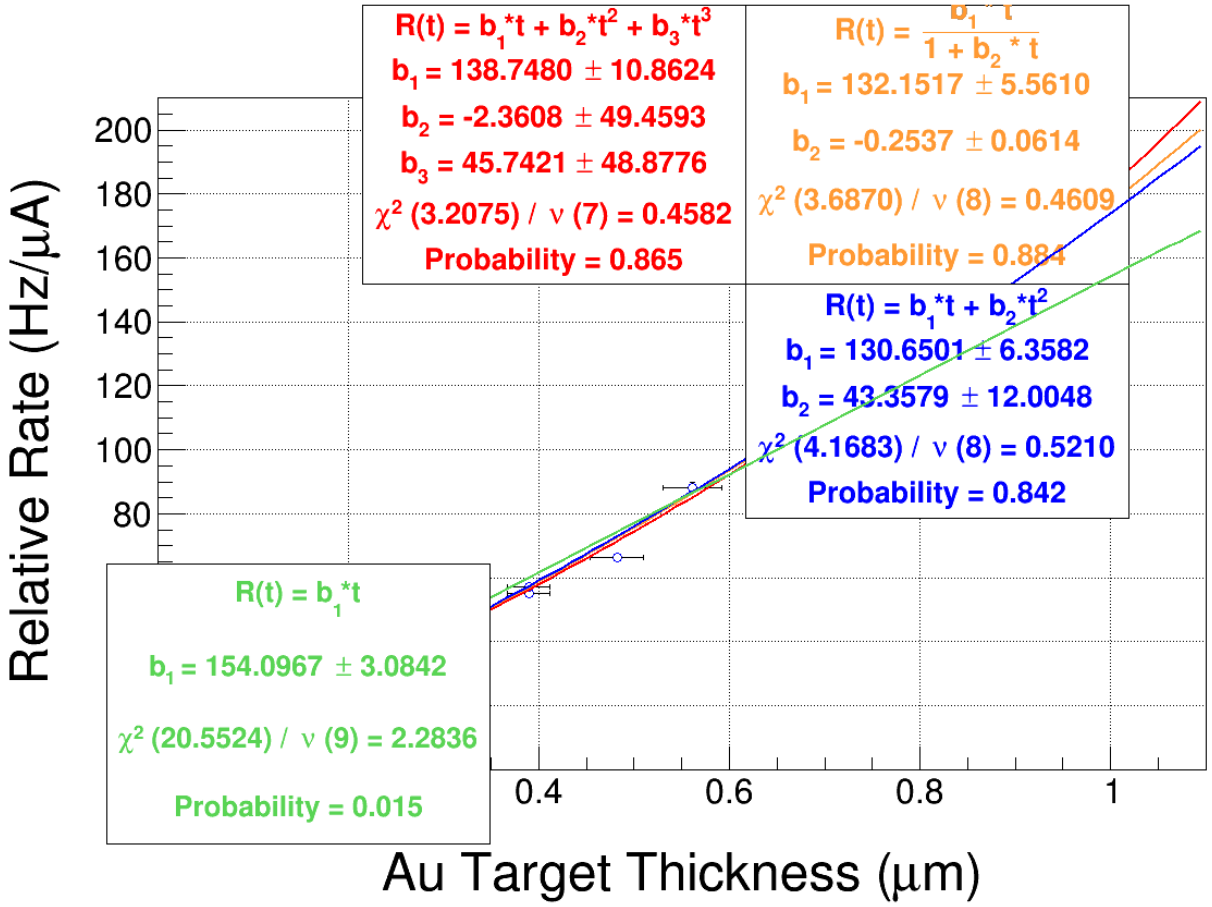
Out[501]=

	Estimate	Standard Error	t- Statistic	P- Value
a1	0.132522	0.00395094	33.5417	6.81482×10^{-10}
b1	−0.000246464	0.0000440822	−5.59101	0.000515623

R vs. T run 1


R(t) = b1*t + b2*t2 + b3*t3
b1 = 149.6616 ± 11.7665
b2 = 4.9994 ± 52.2988
b3 = 35.6881 ± 50.4641
χ2 (3.5036) / ν (7) = 0.5005
Probability = 0.835
R(t) = b1*t / (1 + b2 * t)
b1 = 144.4133 ± 6.0730
b2 = -0.2265 ± 0.0627
χ2 (3.7464) / ν (8) = 0.4683
Probability = 0.879
R(t) = b1*t + b2*t2
b1 = 143.0076 ± 6.8949
b2 = 41.2976 ± 12.9278
χ2 (4.0394) / ν (8) = 0.5049
Probability = 0.854
R(t) = b1*t
b1 = 165.1766 ± 3.2811
χ2 (16.6799) / ν (9) = 1.8533
Probability = 0.054
Relative Rate (Hz/μA)
200
180
160
140
120
100
80
0.4
0.6
0.8
1
Au Target Thickness (μm)

RvsT run 2

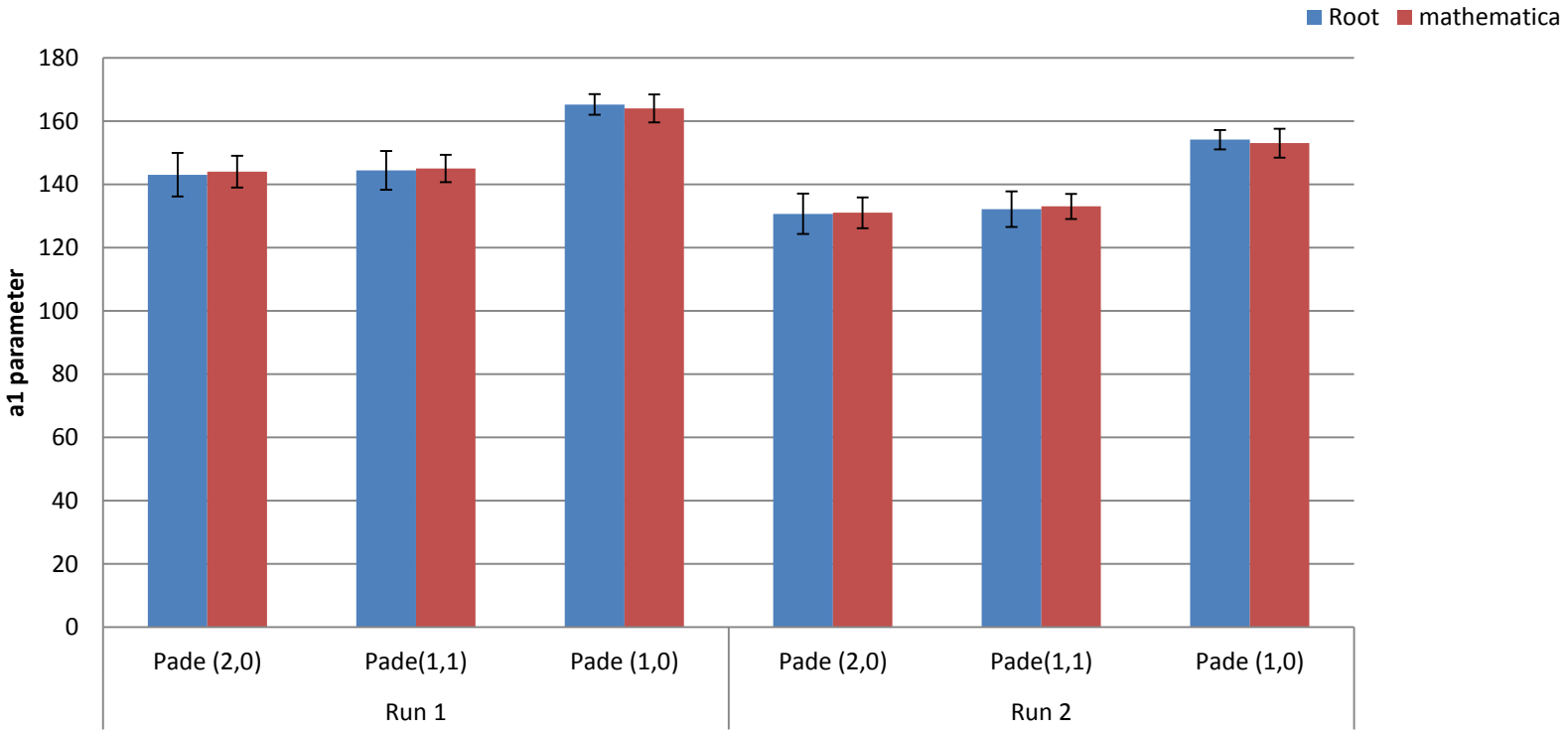

R(t) = b1*t + b2*t2 + b3*t3
b1 = 138.7480 ± 10.8624
b2 = -2.3608 ± 49.4593
b3 = 45.7421 ± 48.8776
χ2 (3.2075) / ν (7) = 0.4582
Probability = 0.865
R(t) = b1*t / (1 + b2*t)
b1 = 132.1517 ± 5.5610
b2 = -0.2537 ± 0.0614
χ2 (3.6870) / ν (8) = 0.4609
Probability = 0.884
R(t) = b1*t + b2*t2
b1 = 130.6501 ± 6.3582
b2 = 43.3579 ± 12.0048
χ2 (4.1683) / ν (8) = 0.5210
Probability = 0.842
R(t) = b1*t
b1 = 154.0967 ± 3.0842
χ2 (20.5524) / ν (9) = 2.2836
Probability = 0.015
Relative Rate (Hz/μA)
200
180
160
140
120
100
80
0.4
0.6
0.8
1
Au Target Thickness (μm)

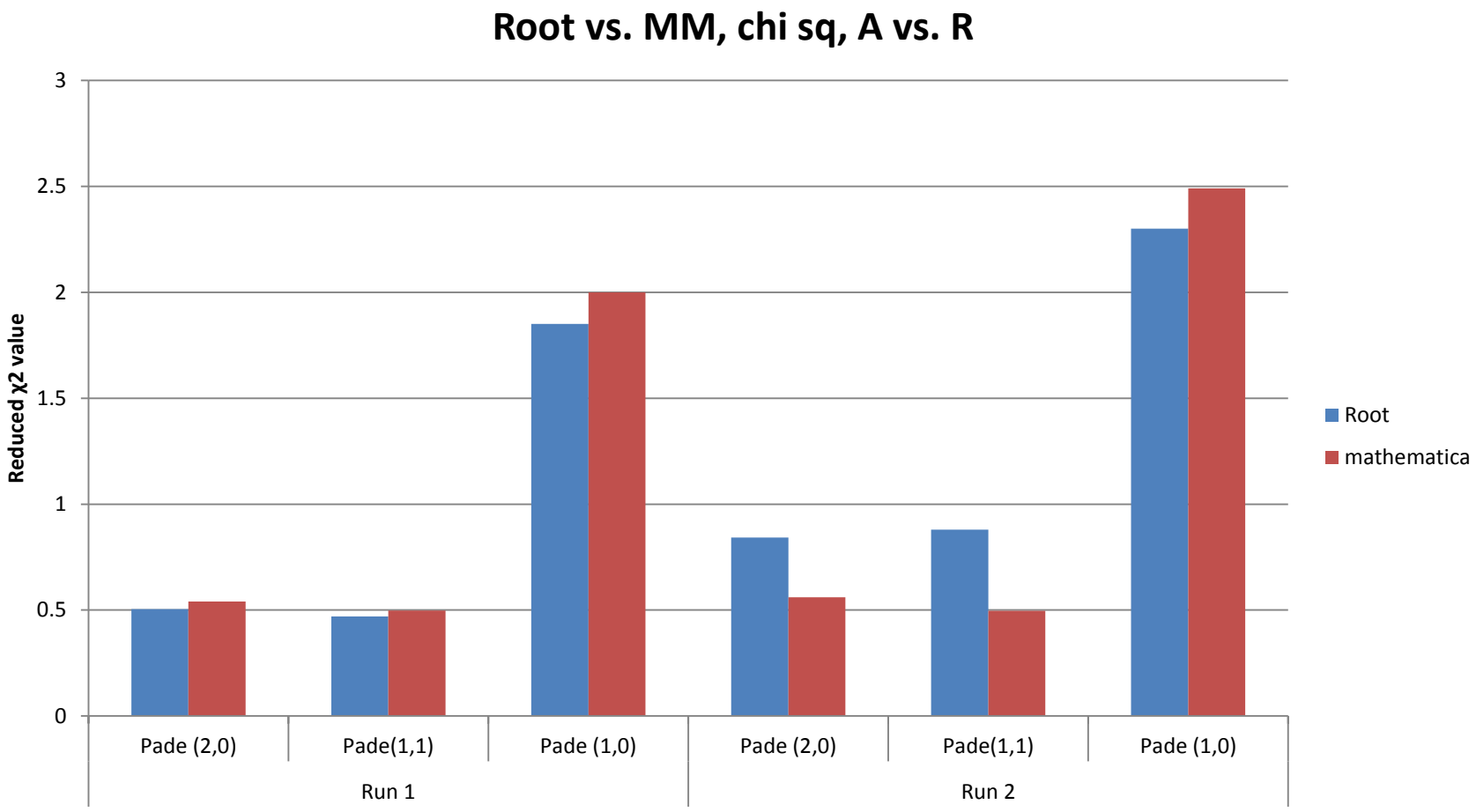
Root vs. Mathematica

R vs. T	a1	Δa1	a2	b1	Chi sq	
Pade (2,0)	143.01	6.9	41.3		0.505	Root
Pade(1,1)	144.41	6.1		-0.23	0.47	Root
~~Pade (1,0)~~	~~165.2~~	~~3.28~~			~~1.85~~	~~Root~~
Pade (2,0)	130.65	6.4	43.36		0.842	Rt run2
Pade(1,1)	132.15	5.6		-0.26	0.88	Rt run2
~~Pade (1,0)~~	~~154.1~~	~~3.08~~			~~2.3~~	~~Rt run2~~

R vs. T	a1	Δa1	a2	b1	Chi sq	
Pade (2,0)	.144	0.005	3.97e-5		0.54	MM run 1
Pade(1,1)	0.145	0.0043		-0.00022	0.498	MM run 1
~~Pade (1,0)~~	~~0.164~~	~~0.0044~~			~~2~~	~~MM run 1~~
Pade (2,0)	0.131	0.0049	4.2e-5		0.56	MM run 2
Pade(1,1)	0.133	0.00395		-2.4e-4	0.496	MM run 2
~~Pade (1,0)~~	~~0.153~~	~~0.0046~~			~~2.49~~	~~MM run 2~~

Root vs. MM, R vs. T




Root vs. MM, chi sq, A vs. R
Reduced χ2 value
3
2.5
2
1.5
1
0.5
0
Pade (2,0)
Pade(1,1)
Pade (1,0)
Pade (2,0)
Pade(1,1)
Pade (1,0)
Run 1
Run 2
Root
mathematica