

~Parabolic vs Elliptical comparison~

XY data below is for a 0.75" radius roller and a 4" radius wheel.

A parabola and an ellipse were least-squares fitted to the data, and the errors plotted.

Parabola: $y = r - kx^2$ ellipse: $x^2/a^2 + y^2/b^2 = 1$

$r = .7499$ $k = .069$ $a = 2.9603$ $b = .7204$

x	y	parabola error	ellipse error
-3.257993	0.017873	-0.000375095	0.211878
-3.15281	0.064182	-0.000156008	0.142252
-3.045976	0.109712	7.66534E-06	0.08194
-2.937456	0.1544	0.000123507	0.030587
-2.827216	0.198174	0.00019878	-0.012189
-2.71523	0.240959	0.000240371	-0.046811
-2.601475	0.282676	0.000254745	-0.073731
-2.485934	0.323241	0.000247886	-0.093441
-2.368599	0.362567	0.000225258	-0.106468
-2.24947	0.40056	0.000191758	-0.113373
-2.128553	0.437127	0.000151681	-0.114752
-2.005867	0.47217	0.000108698	-0.111231
-1.881439	0.505587	6.58358E-05	-0.10346
-1.755309	0.537278	2.54792E-05	-0.092116
-1.627527	0.56714	-1.06177E-05	-0.077887
-1.498155	0.595073	-4.13033E-05	-0.061471
-1.36727	0.620976	-6.59844E-05	-0.043568
-1.234957	0.644751	-8.4567E-05	-0.024865
-1.101317	0.666307	-9.73824E-05	-0.006032
-0.966461	0.685556	-0.000105103	0.012293
-0.830514	0.702416	-0.000108646	0.029511
-0.693608	0.716814	-0.000109076	0.045078
-0.555888	0.728686	-0.000107506	0.058512
-0.417505	0.737978	-0.000104996	0.069403
-0.278619	0.744646	-0.000102474	0.077423
-0.139395	0.74866	-0.000100657	0.082333
0	0.75	-1E-04	0.083986
0.139395	0.74866	-0.000100657	0.082333
0.278619	0.744646	-0.000102474	0.077423
0.417505	0.737978	-0.000104996	0.069403
0.555888	0.728686	-0.000107506	0.058512
0.693608	0.716814	-0.000109076	0.045078
0.830514	0.702416	-0.000108646	0.029511
0.966461	0.685556	-0.000105103	0.012293
1.101317	0.666307	-9.73824E-05	-0.006032
1.234957	0.644751	-8.4567E-05	-0.024865
1.36727	0.620976	-6.59844E-05	-0.043568
1.498155	0.595073	-4.13033E-05	-0.061471
1.627527	0.56714	-1.06177E-05	-0.077887
1.755309	0.537278	2.54792E-05	-0.092116
1.881439	0.505587	6.58358E-05	-0.10346
2.005867	0.47217	0.000108698	-0.111231
2.128553	0.437127	0.000151681	-0.114752
2.24947	0.40056	0.000191758	-0.113373
2.368599	0.362567	0.000225258	-0.106468
2.485934	0.323241	0.000247886	-0.093441
2.601475	0.282676	0.000254745	-0.073731
2.71523	0.240959	0.000240371	-0.046811
2.827216	0.198174	0.00019878	-0.012189
2.937456	0.1544	0.000123507	0.030587
3.045976	0.109712	7.66534E-06	0.08194
3.15281	0.064182	-0.000156008	0.142252
3.257993	0.017873	-0.000375095	0.211878

