

JMP Analysis of Tire Tread Data

Response Hardness - Full Quadratic Model

Summary of Fit

RSquare	0.978161
RSquare Adj	0.958506
Root Mean Square Error	1.073247
Mean of Response	70.375
Observations (or Sum Wgts)	20

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	9	515.91890	57.3243	49.7668
Error	10	11.51860	1.1519	Prob > F
C. Total	19	527.43750		<.0001

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	5	7.310264	1.46205	1.7371
Pure Error	5	4.208333	0.84167	Prob > F
Total Error	10	11.518597		0.2796
				Max RSq
				0.9920

Parameter Estimates

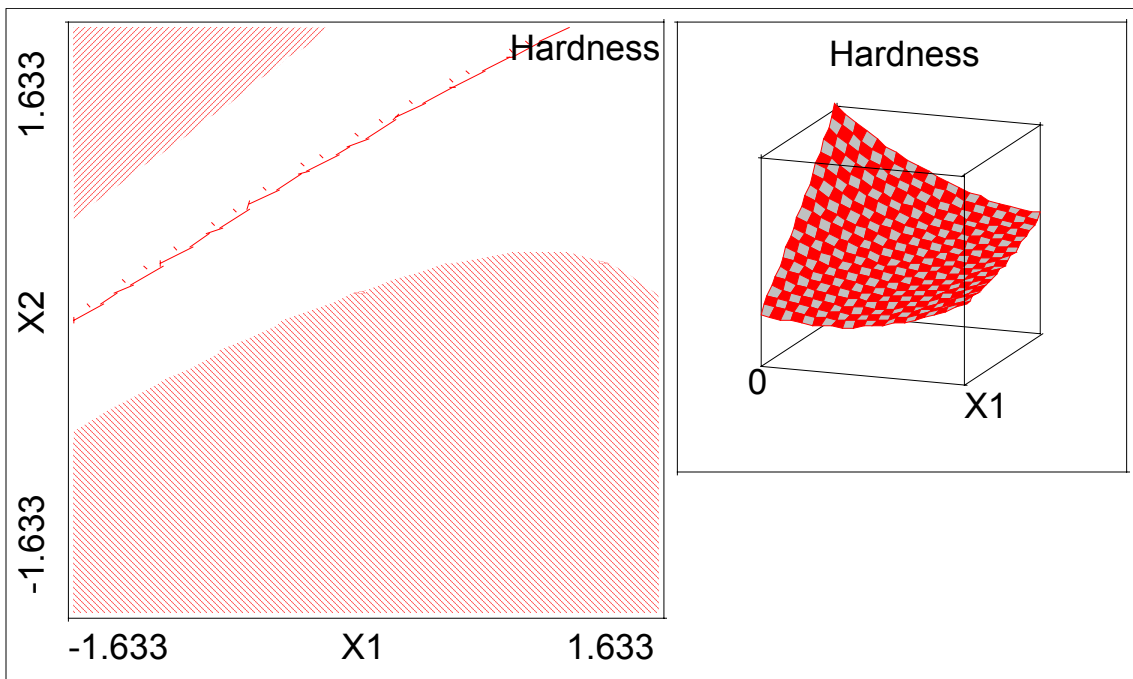
Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	68.990378	0.436463	158.07	<.0001
X1&RS	-1.634845	0.29392	-5.56	0.0002
X2&RS	5.2795323	0.29392	17.96	<.0001
X3&RS	1.9823184	0.29392	6.74	<.0001
X1*X1	1.2548038	0.295329	4.25	0.0017
X2*X1	-2	0.37945	-5.27	0.0004
X2*X2	0.50481	0.295329	1.71	0.1182
X3*X1	-0.25	0.37945	-0.66	0.5249
X3*X2	0.125	0.37945	0.33	0.7486
X3*X3	0.3173116	0.295329	1.07	0.3079

Effect Tests

Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F
X1&RS	1	1	35.63634	30.9381	0.0002
X2&RS	1	1	371.64740	322.6499	<.0001
X3&RS	1	1	52.39466	45.4870	<.0001
X1*X1	1	1	20.79408	18.0526	0.0017
X2*X1	1	1	32.00000	27.7812	0.0004
X2*X2	1	1	3.36546	2.9218	0.1182
X3*X1	1	1	0.50000	0.4341	0.5249
X3*X2	1	1	0.12500	0.1085	0.7486
X3*X3	1	1	1.32972	1.1544	0.3079

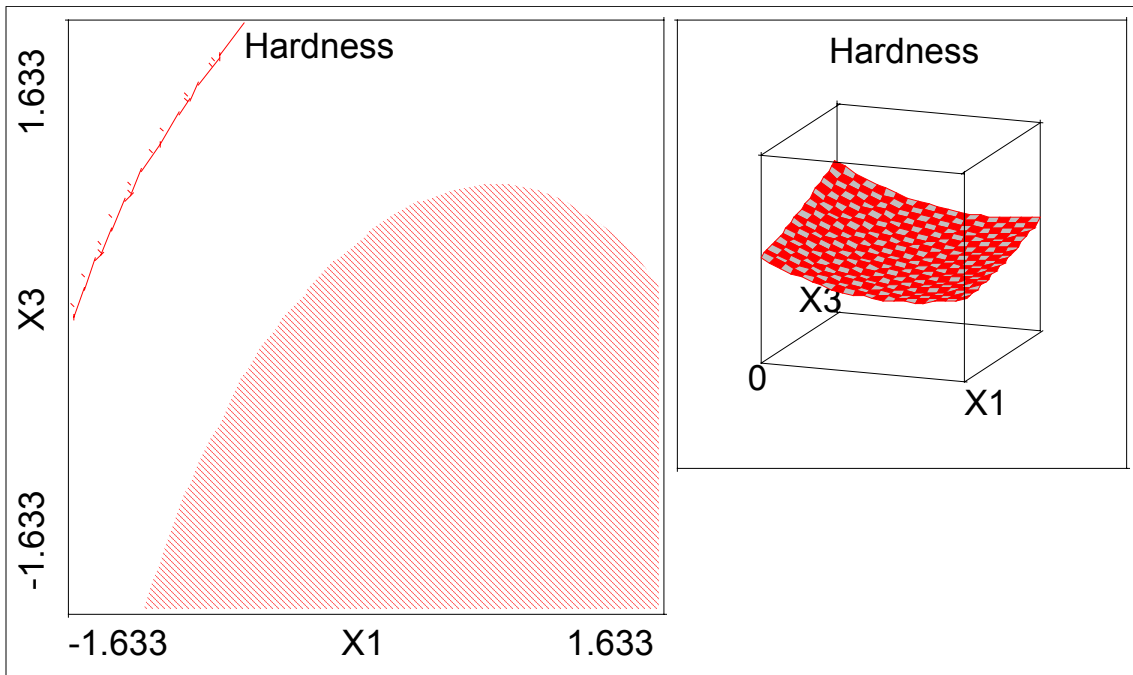
Contour Profiler

Horiz	Vert	Factor	Current X	Response	Contour	Current Y	Lo Limit	Hi Limit
⊙	○	X1	0	Hardness	75	68.990378	70	80
○	⊙	X2	0					
○	○	X3	0					



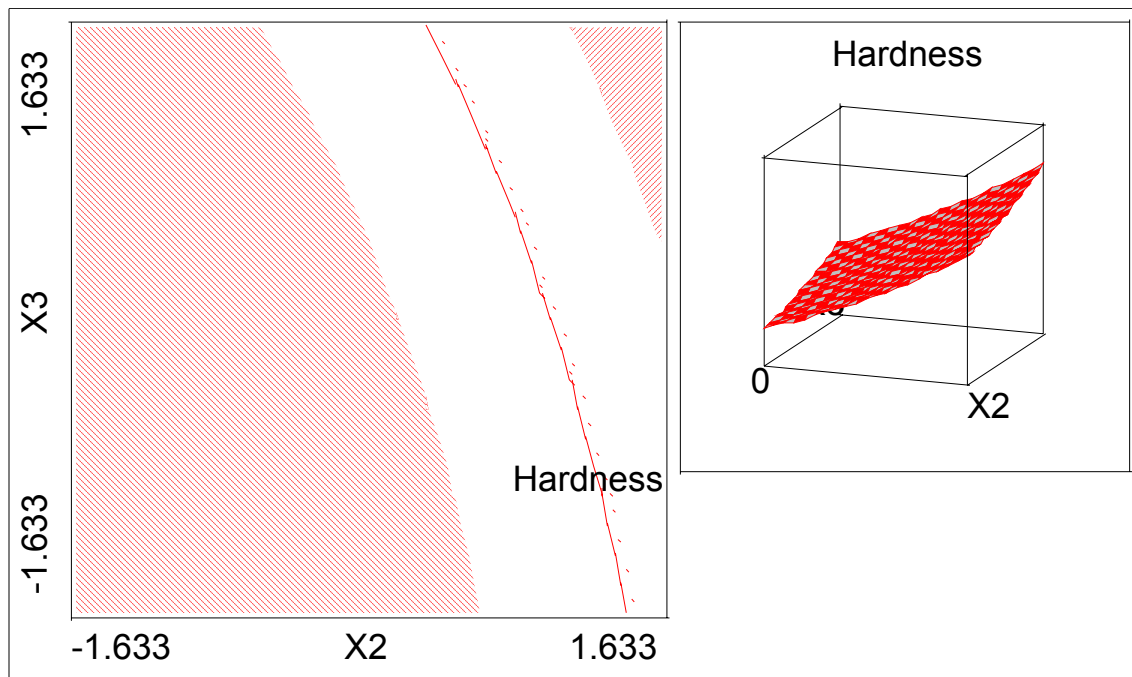
Contour Profiler

Horiz	Vert	Factor	Current X			
⊙	○	X1	0			
○	○	X2	0			
○	⊙	X3	0			
Response		Contour	Current Y	Lo Limit	Hi Limit	
— Hardness		75	68.990378	70	80	



Contour Profiler

Horiz	Vert	Factor	Current X	Response	Contour	Current Y	Lo Limit	Hi Limit
<input type="radio"/>	<input type="radio"/>	X1	0	Hardness	75	68.990378	70	80
<input checked="" type="radio"/>	<input type="radio"/>	X2	2.22e-16					
<input type="radio"/>	<input checked="" type="radio"/>	X3	0					



Response Hardness - Reduced Model Fit

Summary of Fit

RSquare	0.968605
RSquare Adj	0.957392
Root Mean Square Error	1.087562
Mean of Response	70.375
Observations (or Sum Wgts)	20

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	510.87842	102.176	86.3852
Error	14	16.55908	1.183	Prob > F
C. Total	19	527.43750		<.0001

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	9	12.350747	1.37231	1.6305
Pure Error	5	4.208333	0.84167	Prob > F
Total Error	14	16.559081		0.3067
				Max RSq
				0.9920

Parameter Estimates

Term	Estimate	Std Error	t Ratio	Prob> t
Intercept	69.575002	0.313952	221.61	<.0001
X1&RS	-1.634845	0.297841	-5.49	<.0001
X2&RS	5.2795323	0.297841	17.73	<.0001
X3&RS	1.9823184	0.297841	6.66	<.0001
X1*X1	1.1999927	0.297839	4.03	0.0012
X2*X1	-2	0.384511	-5.20	0.0001

Effect Tests

Source	Nparm	DF	Sum of Squares	F Ratio	Prob > F
X1&RS	1	1	35.63634	30.1290	<.0001
X2&RS	1	1	371.64740	314.2121	<.0001
X3&RS	1	1	52.39466	44.2975	<.0001
X1*X1	1	1	19.20002	16.2328	0.0012
X2*X1	1	1	32.00000	27.0546	0.0001