

Análisis de la Corriente, 706B (Experimento para determinación de Curvatura)
CB_706B_SQ_03252006.sgp (CB_706B_SQ_03262006.sfx)
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Analysis Summary

File name: C:\Documents and Settings\Edward A. Moscoso\Mis documentos\Statgraphics\CB_706B_SQ_0

Estimated effects for Ol y Ona 706

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average          = 316,374 +/- 0,524441  
A:Carga          = 25,2563 +/- 0,957493  
B:Vapor_E530    = 12,06 +/- 0,741671  
C:Presión_C525  = 8,17728 +/- 1,13292  
D:Nivel_V540    = -21,2712 +/- 0,428204  
E:Vapor_E532    = -4,68185 +/- 0,741671  
AA              = -3,29358 +/- 0,741671  
AB              = 8,20222 +/- 0,524441  
AC              = -8,38833 +/- 0,524441  
AE              = 1,65278 +/- 0,524441  
BB              = -5,0721 +/- 0,741671  
BC              = 13,1985 +/- 0,524441  
BE              = -3,565 +/- 0,524441  
CC              = -12,7306 +/- 0,741671  
CD              = 2,27296 +/- 0,524441  
CE              = 6,70981 +/- 0,524441  
DE              = -1,245 +/- 0,524441  
EE              = -1,61802 +/- 0,741671  
AAC             = -1,83796 +/- 0,908358  
ABC             = 4,60667 +/- 0,642306  
ACC             = -3,21167 +/- 0,908358  
ACE             = 3,34917 +/- 0,642306  
ADE             = -1,80222 +/- 0,642306  
AEE            = -1,68278 +/- 0,908358  
BBC            = -2,96963 +/- 0,908358  
BCC            = 2,95519 +/- 0,908358  
BCD            = -1,7875 +/- 0,642306  
BCE            = -1,93972 +/- 0,642306  
CCE            = -2,24278 +/- 0,908358  
CEE            = 3,40093 +/- 0,908358  
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Standard errors are based on total error with 213 d.f.

The StatAdvisor

This table shows each of the estimated effects and interactions. Also shown is the standard error of each of the effects, which measures their sampling error. To plot the estimates in decreasing order of importance, select Pareto Charts from the list of Graphical Options. To test the statistical significance of the effects, select ANOVA Table from the list of Tabular Options. You can then remove insignificant effects by pressing the alternate mouse button, selecting Analysis Options, and pressing the Exclude button.

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Analysis of Variance for Ol y Ona 706

Source	Sum of Squares	Df	Mean Square	F-Ratio	P-Value
A:Carga	5166,83	1	5166,83	695,77	0,0000
B:Vapor_E530	1963,49	1	1963,49	264,41	0,0000
C:Presión_C525	386,879	1	386,879	52,10	0,0000
D:Nivel_V540	18324,8	1	18324,8	2467,65	0,0000
E:Vapor_E532	295,916	1	295,916	39,85	0,0000
AA	146,444	1	146,444	19,72	0,0000
AB	1816,46	1	1816,46	244,61	0,0000
AC	1899,83	1	1899,83	255,83	0,0000
AE	73,7552	1	73,7552	9,93	0,0019
BB	347,304	1	347,304	46,77	0,0000
BC	4703,42	1	4703,42	633,37	0,0000
BE	343,149	1	343,149	46,21	0,0000
CC	2187,93	1	2187,93	294,63	0,0000
CD	139,492	1	139,492	18,78	0,0000
CE	1215,58	1	1215,58	163,69	0,0000
DE	41,8507	1	41,8507	5,64	0,0185
EE	35,3431	1	35,3431	4,76	0,0302
AAC	30,403	1	30,403	4,09	0,0443
ABC	381,985	1	381,985	51,44	0,0000
ACC	92,8332	1	92,8332	12,50	0,0005
ACE	201,905	1	201,905	27,19	0,0000
ADE	58,4641	1	58,4641	7,87	0,0055
AEE	25,4857	1	25,4857	3,43	0,0653
BBC	79,3683	1	79,3683	10,69	0,0013
BCC	78,5981	1	78,5981	10,58	0,0013
BCD	57,5128	1	57,5128	7,74	0,0059
BCE	67,7254	1	67,7254	9,12	0,0028
CCE	45,2705	1	45,2705	6,10	0,0143
CEE	104,097	1	104,097	14,02	0,0002
Total error	1581,74	213	7,42603		
Total (corr.)	65311,1	242			

R-squared = 97,5781 percent
 R-squared (adjusted for d.f.) = 97,2484 percent
 Standard Error of Est. = 2,72507
 Mean absolute error = 1,91778
 Durbin-Watson statistic = 1,83935 (P=0,1056)
 Lag 1 residual autocorrelation = 0,0777477

The StatAdvisor

The ANOVA table partitions the variability in Ol y Ona 706 into separate pieces for each of the effects. It then tests the statistical significance of each effect by comparing the mean square against an estimate of the experimental error. In this case, 28 effects have P-values less than 0,05, indicating that they are significantly different from zero at the 95,0% confidence level.

The R-Squared statistic indicates that the model as fitted explains 97,5781% of the variability in Ol y Ona 706. The adjusted R-squared statistic, which is more suitable for comparing models with different numbers of independent variables, is 97,2484%. The standard error of the estimate shows the standard deviation of the residuals to be 2,72507. The mean absolute error (MAE) of 1,91778 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file. Since the P-value is greater than 0.05, there is no indication of serial autocorrelation in the residuals.

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Regression coeffs. for Ol y Ona 706

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constant      = 316,374
A:Carga       = 12,6281
B:Vapor E530  = 6,03
C:Presión C525 = 4,08864
D:Nivel V540  = -10,6356
E:Vapor E532  = -2,34093
AA           = -1,64679
AB           = 4,10111
AC           = -4,19417
AE           = 0,826389
BB           = -2,53605
BC           = 6,59926
BE           = -1,7825
CC           = -6,36531
CD           = 1,13648
CE           = 3,35491
DE           = -0,6225
EE           = -0,809012
AAC          = 0,0
ACC          = -1,60583
AEE          = -0,841389
BBC          = 0,0
BCC          = 1,47759
CCE          = 0,0
CEE          = 1,70046
ABC          = -0,100463
ACD          = -0,918981
ACE          = -0,365787
ADE          = -0,901111
BCD          = -2,37856
BCE          = -3,57606
CDE          = -1,12139
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The StatAdvisor

 This pane displays the regression equation which has been fitted to the data. The equation of the fitted model is

$$\begin{aligned}
 \text{Ol y Ona 706} = & 316,374 + 12,6281 \cdot \text{Carga} + 6,03 \cdot \text{Vapor E530} + \\
 & 4,08864 \cdot \text{Presión C525} - 10,6356 \cdot \text{Nivel V540} - 2,34093 \cdot \text{Vapor_E532} - \\
 & 1,64679 \cdot \text{Carga}^2 + 4,10111 \cdot \text{Carga} \cdot \text{Vapor E530} - \\
 & 4,19417 \cdot \text{Carga} \cdot \text{Presión C525} + 0,826389 \cdot \text{Carga} \cdot \text{Vapor E532} - \\
 & 2,53605 \cdot \text{Vapor E530}^2 + 6,59926 \cdot \text{Vapor E530} \cdot \text{Presión C525} - \\
 & 1,7825 \cdot \text{Vapor E530} \cdot \text{Vapor E532} - 6,36531 \cdot \text{Presión C525}^2 + \\
 & 1,13648 \cdot \text{Presión C525} \cdot \text{Nivel V540} + 3,35491 \cdot \text{Presión C525} \cdot \text{Vapor_E532} - \\
 & 0,6225 \cdot \text{Nivel V540} \cdot \text{Vapor E532} - 0,809012 \cdot \text{Vapor E532}^2 + \\
 & 0,0 \cdot \text{Carga}^2 \cdot \text{Presión C525} - 0,100463 \cdot \text{Carga} \cdot \text{Vapor E530} \cdot \text{Presión C525} - \\
 & 1,60583 \cdot \text{Carga} \cdot \text{Presión C525}^2 - 0,918981 \cdot \text{Carga} \cdot \text{Presión C525} \cdot \text{Nivel V540} - \\
 & 0,365787 \cdot \text{Carga} \cdot \text{Presión C525} \cdot \text{Vapor E532} - \\
 & 0,901111 \cdot \text{Carga} \cdot \text{Nivel V540} \cdot \text{Vapor E532} - 0,841389 \cdot \text{Carga} \cdot \text{Vapor E532}^2 + \\
 & 0,0 \cdot \text{Vapor E530}^2 \cdot \text{Presión C525} + 1,47759 \cdot \text{Vapor E530} \cdot \text{Presión C525}^2 - \\
 & 2,37856 \cdot \text{Vapor E530} \cdot \text{Presión C525} \cdot \text{Nivel V540} - \\
 & 3,57606 \cdot \text{Vapor E530} \cdot \text{Presión C525} \cdot \text{Vapor_E532} + \\
 & 0,0 \cdot \text{Presión C525}^2 \cdot \text{Vapor E532} - \\
 & 1,12139 \cdot \text{Presión C525} \cdot \text{Nivel V540} \cdot \text{Vapor_E532} + \\
 & 1,70046 \cdot \text{Presión C525} \cdot \text{Vapor_E532}^2
 \end{aligned}$$

where the values of the variables are specified in their original units. To have STATGRAPHICS evaluate this function, select Predictions from the list of Tabular Options. To plot the function, select Response Plots from the list of Graphical Options.

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Estimation Results for Ol y Ona 706

Row	Observed Value	Fitted Value	Lower 95,0% CL for Mean	Upper 95,0% CL for Mean
1	304,95	306,247	303,795	308,698
2	321,02	319,499	317,475	321,523
3	329,44	331,295	328,844	333,747
4	304,79	306,327	304,281	308,373
5	321,4	321,377	319,663	323,092
6	336,5	334,972	332,926	337,018
7	304,6	304,306	301,854	306,757
8	320,46	321,153	319,129	323,177
9	337,24	336,545	334,094	338,997
10	316,28	309,965	307,997	311,934
11	319,54	317,57	315,991	319,15
12	316,65	321,882	319,914	323,85
13	316,19	316,213	314,486	317,94
14	332,15	327,919	326,551	329,287
15	337,78	336,331	334,604	338,059
16	315,2	317,388	315,42	319,356
17	331,86	333,195	331,616	334,775
18	349,84	345,709	343,741	347,677
19	303,62	303,453	301,001	305,905
20	301,93	302,199	300,175	304,223
21	297,02	295,813	293,362	298,265
22	319,58	318,822	316,776	320,868
23	322,02	323,973	322,258	325,687
24	323,61	323,992	321,946	326,038
25	325,01	326,15	323,698	328,602
26	341,25	337,705	335,681	339,729
27	344,65	344,128	341,676	346,58
28	292,77	293,302	291,182	295,423
29	308,26	307,456	305,728	309,183
30	318,35	320,153	318,033	322,274
31	290,47	294,277	292,524	296,029
32	308,48	310,228	308,736	311,72
33	326,3	324,723	322,97	326,476
34	293,65	293,149	291,028	295,269
35	309,6	310,897	309,17	312,625
36	327,96	327,191	325,07	329,311
37	303,73	299,051	297,311	300,791
38	305,21	307,557	306,126	308,988
39	311,42	312,77	311,03	314,51
40	303,99	305,299	303,837	306,761
41	320,41	317,906	316,712	319,1
42	326,22	327,219	325,757	328,681
43	306,6	306,474	304,734	308,214
44	322,78	323,182	321,751	324,613
45	338,77	336,597	334,857	338,337
46	288,8	294,569	292,448	296,69
47	292,45	294,216	292,489	295,943
48	293,98	288,732	286,611	290,852
49	312,27	309,045	307,292	310,797
50	313,47	315,096	313,604	316,588
51	313,48	316,016	314,263	317,769
52	313,79	315,478	313,358	317,599
53	327,48	327,934	326,207	329,662
54	335,93	335,259	333,138	337,38
55	281,15	280,358	277,906	282,81
56	297,38	295,412	293,388	297,436
57	306,87	309,011	306,559	311,463
58	283,81	282,226	280,18	284,272
59	298,64	299,078	297,364	300,792
60	315,14	314,475	312,429	316,521
61	283,79	281,992	279,54	284,443
62	299,6	300,642	298,618	302,666
63	315,64	317,836	315,384	320,288
64	290,55	288,137	286,169	290,105
65	295,54	297,544	295,965	299,123
66	301,62	303,658	301,69	305,626
67	293,05	294,384	292,657	296,112
68	310,51	307,893	306,525	309,26

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69	317,61	318,107	316,38	319,835
70	296,95	295,56	293,592	297,528
71	311,79	313,169	311,59	314,748
72	327,66	327,485	325,517	329,453
73	278,42	285,685	283,233	288,137
74	294,47	286,233	284,209	288,257
75	284,06	281,65	279,198	284,102
76	301,35	299,267	297,221	301,313
77	303,63	306,22	304,505	307,934
78	302,29	308,041	305,995	310,087
79	303,2	304,807	302,355	307,259
80	318,83	318,164	316,14	320,188
81	326,58	326,39	323,938	328,841
82	300,33	302,48	300,434	304,526
83	315,53	316,626	314,873	318,379
84	332,71	329,317	327,271	331,363
85	299,17	301,748	300,008	303,488
86	315,24	317,692	316,085	319,299
87	331,96	332,181	330,441	333,921
88	299,99	298,913	296,868	300,959
89	314,99	316,655	314,903	318,408
90	332,99	332,942	330,896	334,988
91	310,3	308,27	306,663	309,877
92	318,9	318,444	317,177	319,71
93	321,02	325,324	323,717	326,931
94	310,06	312,735	311,335	314,134
95	326,93	327,01	325,893	328,126
96	338,97	337,991	336,591	339,391
97	310,62	312,127	310,52	313,735
98	329,32	330,504	329,237	331,77
99	345,78	345,586	343,979	347,193
100	300,51	301,585	299,54	303,631
101	303,19	304,575	302,822	306,328
102	305,88	302,433	300,387	304,479
103	317,95	314,202	312,462	315,943
104	321,72	323,596	321,989	325,203
105	324,89	327,859	326,119	329,599
106	319,36	318,778	316,732	320,824
107	336,32	334,576	332,823	336,329
108	347,78	345,243	343,197	347,289
109	287,29	289,814	287,986	291,641
110	303,95	303,96	302,468	305,453
111	318,63	316,651	314,824	318,479
112	288,79	289,976	288,369	291,583
113	304,28	305,92	304,458	307,382
114	319,58	320,409	318,802	322,016
115	289,74	288,035	286,208	289,862
116	306,75	305,777	304,285	307,269
117	321,41	322,064	320,236	323,891
118	297,05	297,634	296,083	299,185
119	302,49	307,808	306,614	309,002
120	308,1	314,688	313,138	316,239
121	300,19	302,099	300,764	303,434
122	317,48	316,374	315,34	317,408
123	331,05	327,355	326,021	328,69
124	301,84	301,492	299,941	303,042
125	318,37	319,868	318,674	321,062
126	329,2	334,95	333,4	336,501
127	291,97	292,98	291,153	294,808
128	294,42	295,97	294,477	297,462
129	296,07	293,827	292,0	295,655
130	308,97	304,703	303,096	306,31
131	315,21	314,097	312,635	315,559
132	316,12	318,36	316,753	319,967
133	310,09	308,385	306,557	310,212
134	324,86	324,183	322,691	325,675
135	334,81	334,85	333,023	336,678
136	277,22	277,148	275,102	279,194
137	294,87	291,295	289,542	293,047
138	311,17	303,985	301,94	306,031
139	279,2	278,204	276,464	279,944
140	295,29	294,148	292,541	295,755
141	311,72	308,637	306,896	310,377

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142	279,3	277,157	275,111	279,203
143	294,85	294,899	293,146	296,652
144	312,6	311,185	309,139	313,231
145	289,0	286,998	285,391	288,606
146	295,73	297,172	295,906	298,438
147	301,26	304,053	302,445	305,66
148	290,39	291,463	290,064	292,863
149	305,83	305,738	304,622	306,855
150	321,4	316,72	315,32	318,119
151	291,73	290,856	289,249	292,463
152	307,56	309,232	307,966	310,498
153	322,77	324,315	322,708	325,922
154	286,68	284,375	282,329	286,421
155	286,68	287,364	285,611	289,117
156	289,49	285,222	283,176	287,268
157	294,6	295,204	293,464	296,944
158	305,05	304,598	302,991	306,205
159	305,28	308,861	307,12	310,601
160	298,96	297,992	295,946	300,038
161	314,17	313,79	312,038	315,543
162	322,77	324,457	322,411	326,503
163	295,18	295,377	292,925	297,828
164	310,58	308,735	306,711	310,759
165	325,73	320,637	318,185	323,089
166	294,21	293,832	291,786	295,878
167	309,49	308,988	307,274	310,702
168	324,17	322,688	320,642	324,734
169	293,18	290,185	287,733	292,637
170	308,01	307,139	305,115	309,163
171	322,97	322,637	320,185	325,088
172	305,28	306,639	304,67	308,607
173	321,14	317,699	316,119	319,278
174	324,48	325,465	323,497	327,433
175	306,7	309,321	307,594	311,048
176	321,68	324,482	323,115	325,85
177	340,29	336,35	334,622	338,077
178	308,26	306,931	304,963	308,9
179	323,67	326,194	324,614	327,773
180	341,46	342,162	340,194	344,13
181	306,54	303,184	300,732	305,635
182	305,68	308,734	306,71	310,758
183	308,92	309,152	306,701	311,604
184	314,89	313,048	311,002	315,094
185	332,4	325,003	323,289	326,717
186	327,86	331,826	329,78	333,872
187	310,63	314,871	312,42	317,323
188	327,17	333,23	331,206	335,254
189	347,64	346,458	344,006	348,91
190	282,85	282,989	280,869	285,11
191	298,89	295,446	293,719	297,174
192	301,04	306,448	304,327	308,568
193	282,13	282,339	280,586	284,091
194	296,23	296,593	295,101	298,085
195	310,66	309,392	307,64	311,145
196	281,17	279,585	277,465	281,706
197	295,35	295,638	293,911	297,365
198	309,56	310,235	308,114	312,355
199	295,54	296,282	294,542	298,022
200	307,9	306,44	305,009	307,872
201	312,97	313,306	311,566	315,046
202	296,15	298,964	297,502	300,426
203	313,71	313,224	312,03	314,418
204	329,35	324,19	322,728	325,652
205	297,86	296,574	294,834	298,314
206	313,48	314,935	313,504	316,367
207	330,16	330,003	328,263	331,743
208	294,07	294,857	292,736	296,978
209	298,88	299,506	297,779	301,233
210	295,04	299,023	296,903	301,144
211	301,48	303,828	302,075	305,581
212	318,39	314,881	313,389	316,373
213	319,56	320,803	319,05	322,556
214	305,3	304,757	302,636	306,878

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215	322,13	322,215	320,488	323,942
216	336,4	334,541	332,421	336,662
217	271,36	270,602	268,15	273,054
218	283,5	282,158	280,134	284,182
219	281,55	292,258	289,806	294,71
220	269,5	270,845	268,799	272,891
221	282,94	284,199	282,484	285,913
222	293,66	296,097	294,051	298,143
223	268,95	268,986	266,534	271,437
224	281,88	284,137	282,113	286,161
225	295,39	297,833	295,381	300,284
226	284,81	285,925	283,956	287,893
227	298,95	295,182	293,603	296,761
228	303,33	301,146	299,178	303,115
229	286,65	288,607	286,88	290,334
230	302,16	301,966	300,598	303,333
231	316,63	312,031	310,304	313,758
232	288,35	286,217	284,249	288,186
233	303,37	303,677	302,098	305,256
234	319,16	317,844	315,875	319,812
235	286,48	286,53	284,078	288,982
236	288,68	290,278	288,254	292,302
237	291,02	288,894	286,443	291,346
238	294,27	294,607	292,561	296,653
239	305,25	304,76	303,045	306,474
240	307,08	309,781	307,735	311,826
241	296,16	294,643	292,191	297,095
242	310,28	311,2	309,176	313,224
243	325,17	322,625	320,173	325,077

The StatAdvisor

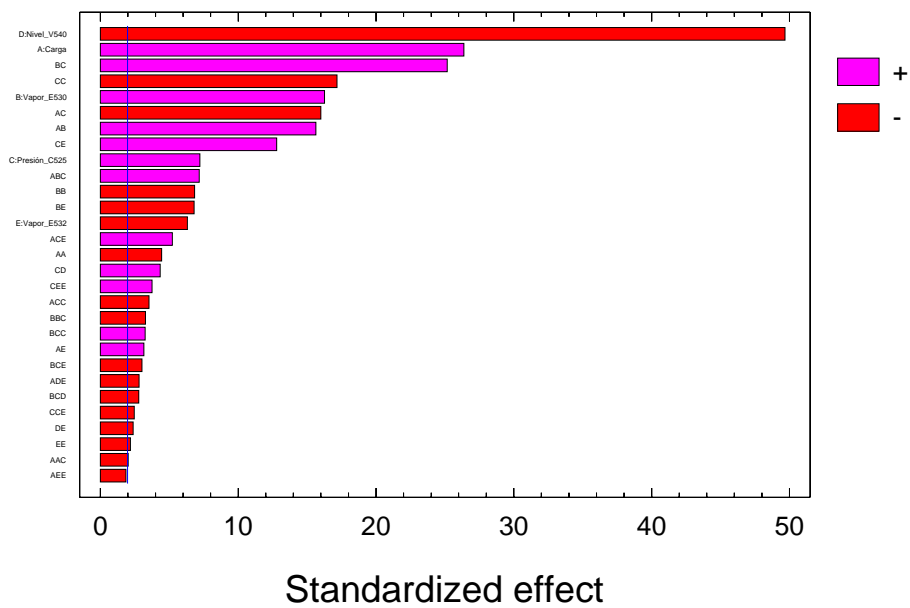
 This table contains information about values of Ol_y_Ona_706 generated using the fitted model. The table includes:

- (1) the observed value of Ol y Ona 706 (if any)
- (2) the predicted value of Ol y Ona 706 using the fitted model
- (3) 95,0% confidence limits for the mean response

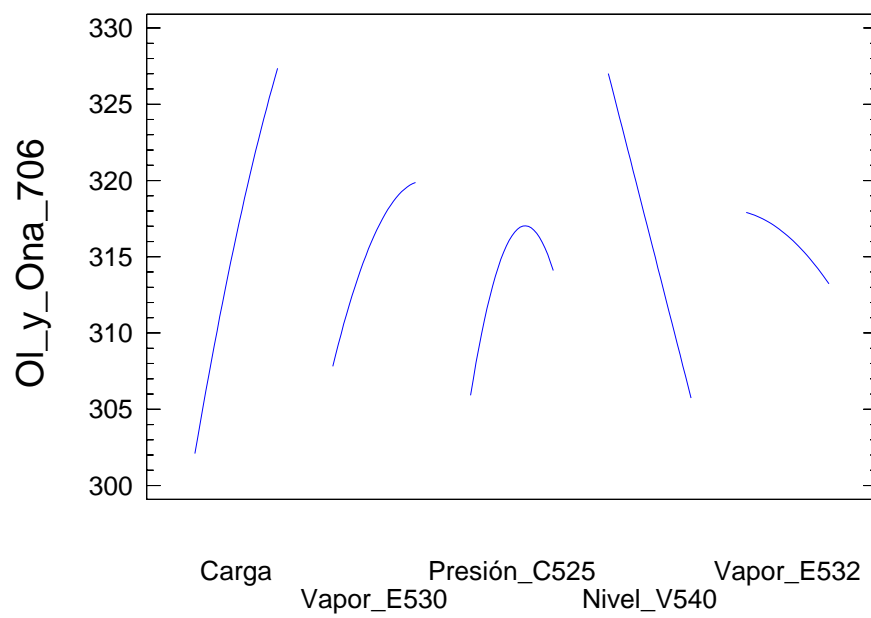
Each item corresponds to the values of the experimental factors in a specific row of your data file. To generate forecasts for additional combinations of the factors, add additional rows to the bottom of your data file. In each new row, enter values for the experimental factors but leave the cell for the response empty. When you return to this pane, forecasts will be added to the table for the new rows, but the model will be unaffected.

Análisis de la Corriente, 706B (Experimento para determinación de Curvatura)
CB_706B_SQ_03252006.sgp (CB_706B_SQ_03262006.sfx)
16/04/2006 3:32 p.m.

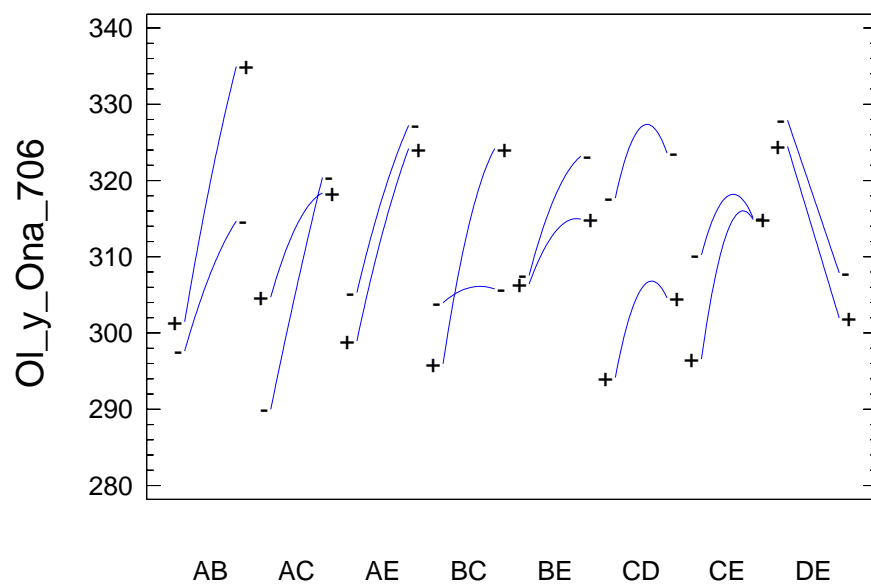
Standardized Pareto Chart for Ol_y_Ona_706



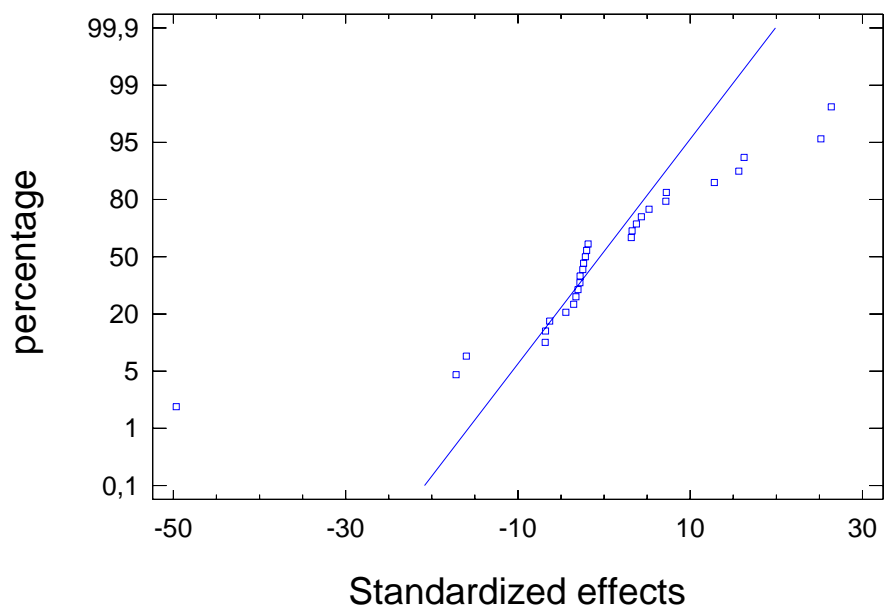
Main Effects Plot for Ol_y_Ona_706



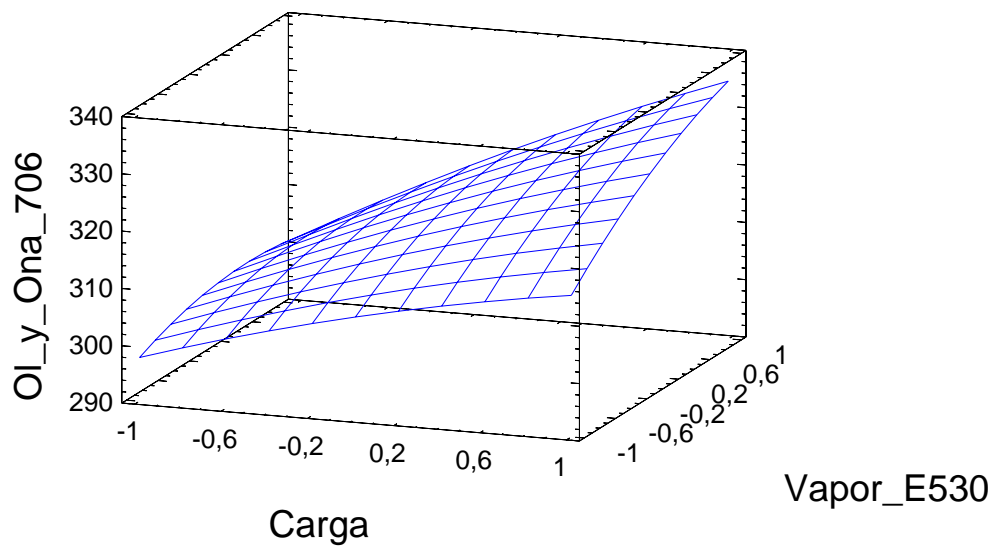
Interaction Plot for OI_y_Ona_706



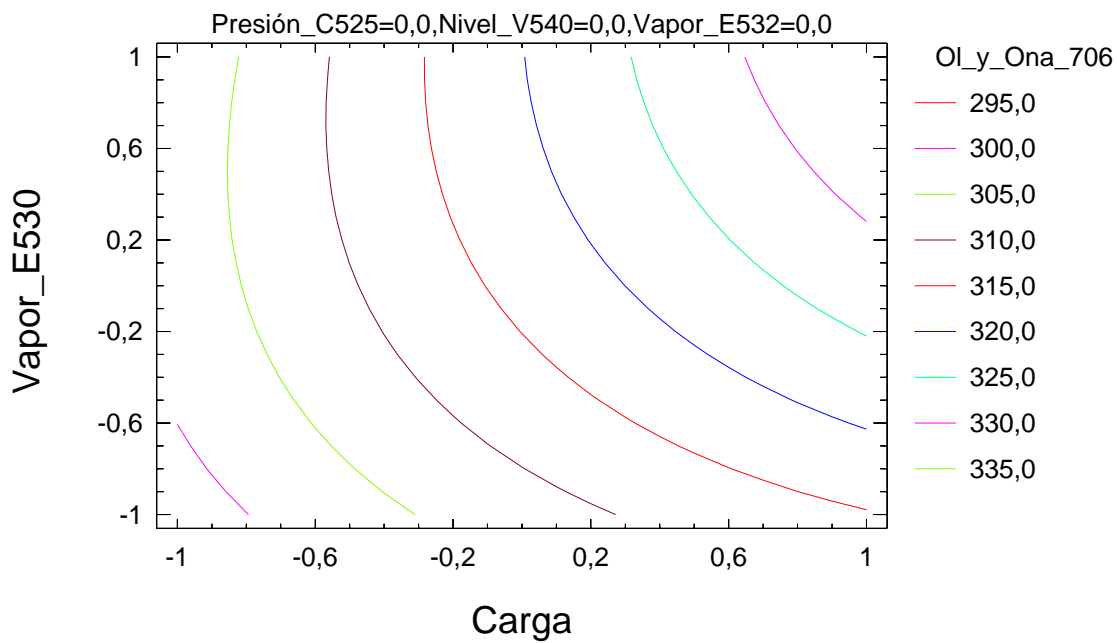
Normal Probability Plot for Ol_y_Ona_706



Estimated Response Surface
Presión_C525=0,0,Nivel_V540=0,0,Vapor_E532=0,0



Contours of Estimated Response Surface



n de Curvatura)
Q 03262006.sfx)
2006 3:32 p.m.

Residual Plot for Ol_y_Ona_706

