

Appendix

Table A1 Analysis of variance for responses

Term	DF	Seq. SS	Adj. MS	F	p
Twist efficiency					
Regression	9	0.017579	0.001953	10.36	0.001
X_1	1	0.000423	0.000423	2.24	0.165
X_2	1	0.002481	0.002481	13.16	0.005
X_3	1	0.012325	0.012325	65.35	0.000
$X_1 * X_1$	1	0.000106	0.000106	0.56	0.471
$X_2 * X_2$	1	0.000819	0.000819	4.34	0.064
$X_3 * X_3$	1	0.001249	0.001249	6.62	0.028
$X_1 * X_2$	1	0.000001	0.000001	0.01	0.940
$X_1 * X_3$	1	0.000171	0.000171	0.91	0.363
$X_2 * X_3$	1	0.000028	0.000028	0.15	0.707
Residual error	10	0.001886	0.000189		
Lack-of-fit	5	0.001131	0.000226	1.50	0.334
Pure error	5	0.000755	0.000151		
Total	19	0.019465			
R ² =90.31% R ² (adj.)=81.59%					
Trapping coefficient					
Regression	9	0.019255	0.002139	11.16	0.000
X_1	1	0.000465	0.000465	2.43	0.150
X_2	1	0.002383	0.002383	12.44	0.005
X_3	1	0.014050	0.014050	73.32	0.000
$X_1 * X_1$	1	0.000122	0.000122	0.64	0.444
$X_2 * X_2$	1	0.000934	0.000934	4.88	0.052
$X_3 * X_3$	1	0.001106	0.001106	5.77	0.037
$X_1 * X_2$	1	0.000001	0.000001	0.01	0.940
$X_1 * X_3$	1	0.000190	0.000190	0.99	0.343
$X_2 * X_3$	1	0.000021	0.000021	0.11	0.747
Residual error	10	0.001916	0.000192		
Lack-of-fit	5	0.001152	0.000230	1.51	0.332
Pure error	5	0.000765	0.000153		
Total	19	0.021171			
R ² =90.95% R ² (adj.)=82.80%					
Congestion coefficient					
Regression	9	0.013140	0.001460	11.33	0.000
X_1	1	0.000234	0.000234	1.82	0.207
X_2	1	0.001745	0.001745	13.54	0.004
X_3	1	0.009509	0.009509	73.79	0.000
$X_1 * X_1$	1	0.000077	0.000077	0.60	0.458
$X_2 * X_2$	1	0.000519	0.000519	4.02	0.073
$X_3 * X_3$	1	0.000950	0.000950	7.37	0.022
$X_1 * X_2$	1	0.000000	0.000000	0.00	1.000
$X_1 * X_3$	1	0.000113	0.000113	0.87	0.372
$X_2 * X_3$	1	0.000008	0.000008	0.06	0.808
Residual error	10	0.001289	0.000129		
Lack-of-fit	5	0.000791	0.000158	1.59	0.312
Pure error	5	0.000498	0.000100		
Total	19	0.014429			
R ² =91.07% R ² (adj.)=83.03%					

Seq. SS: sequential sum of squares, Adj. MS: adjusted mean squares

Table A2 Analysis of the reduced regression model

Term	DF	Seq. SS	Adj. MS	<i>F</i>	<i>p</i>
Twist efficiency					
Regression	4	0.016850	0.004212	24.16	0.000
X_2	1	0.002481	0.002481	14.23	0.002
X_3	1	0.012325	0.012325	70.69	0.000
$X_2 * X_2$	1	0.000888	0.000888	5.09	0.039
$X_3 * X_3$	1	0.001335	0.001335	7.66	0.014
Residual error	15	0.002615	0.000174		
Lack-of-fit	4	0.000994	0.000248	1.69	0.223
Pure error	11	0.001621	0.000147		
Total	19	0.019465			
$R^2=86.56\%$ $R^2(\text{adj.})=82.98\%$					
Trapping coefficient					
Regression	4	0.018455	0.004614	25.49	0.000
X_2	1	0.002383	0.002383	13.16	0.002
X_3	1	0.014050	0.014050	77.61	0.000
$X_2 * X_2$	1	0.001012	0.001012	5.59	0.032
$X_3 * X_3$	1	0.001191	0.001191	6.58	0.022
Residual error	15	0.002716	0.000181		
Lack-of-fit	4	0.000997	0.000249	1.60	0.244
Pure error	11	0.001719	0.000156		
Total	19	0.021171			
$R^2=87.17\%$ $R^2(\text{adj.})=83.75\%$					
Congestion coefficient					
Regression	4	0.012708	0.003177	27.70	0.000
X_2	1	0.001745	0.001745	15.21	0.001
X_3	1	0.009509	0.009509	82.90	0.000
$X_2 * X_2$	1	0.000565	0.000565	4.92	0.042
$X_3 * X_3$	1	0.001015	0.001015	8.85	0.009
Residual error	15	0.001720	0.000115		
Lack-of-fit	4	0.000690	0.000172	1.84	0.192
Pure error	11	0.001031	0.000094		
Total	19	0.014429			
$R^2=88.08\%$ $R^2(\text{adj.})=84.90\%$					