



Addendum to “Polynomial relations for cylindrical wheel stiffness characterization for use in a rolling noise prediction model”

Acta Acustica, 4, 4, <https://doi.org/10.1051/aacus/2020003>

Matthew Edwards^{1,*}, Fabien Chevillotte¹, François-Xavier Bécot¹, Luc Jaouen¹, and Nicolas Totaro²

¹Matelys Research Lab, 7 Rue des Maraîchers, Bât B, 69120 Vaulx-en-Velin, France

²INSA-Lyon, 20 Avenue Albert Einstein, 69621 Villeurbanne cedex, France

Received 25 November 2020, Accepted 5 December 2020

The authors wish to correct three errors that appear in the above manuscript:

1. A typographical error was made in equation (8). The correct form is given below:

$$f = r_A/r_W. \quad (8)$$

2. The rounded polynomial in equation (10) will not yield sufficiently precise results if evaluated as was originally presented. The equation with exact coefficients is given below:

$$P(f, g) = \frac{K}{wE} = \exp(95.448f^3 + 280.369f^4g - 1319.105f^3g^2 + 4004.448f^2g^3 - 9965.202fg^4 + 1052707.575g^5 - 249.304f^4 - 351.973f^3g + 1108.967f^2g^2 + 75.910fg^3 - 305.716.234g^4 + 246.535f^3 + 123.059f^2g - 453.953fg^2 + 33.012.778g^3 - 116.952f^2 + 7.302fg - 1.625.255g^2 + 28.714f + 42.606g - 4.643). \quad (10)$$

3. The exact values of the lookup table were not provided, making use of the lookup table method impossible as originally presented. They are given below:

Table 5. Lookup table exact values: K_{norm} .

r_A/r_W [-]	a/r_W [-]					
	0.003	0.0037	0.0045	0.0056	0.0068	0.0084
0.05	0.036	0.035	0.038	0.04	0.041	0.041
0.15	0.113	0.115	0.12	0.124	0.127	0.136
0.25	0.185	0.191	0.198	0.205	0.213	0.222
0.35	0.244	0.254	0.263	0.274	0.284	0.296
0.45	0.29	0.301	0.313	0.326	0.339	0.354
0.55	0.321	0.333	0.347	0.362	0.377	0.395
0.65	0.341	0.356	0.371	0.389	0.406	0.426
0.75	0.365	0.382	0.399	0.418	0.441	0.463
0.8	0.385	0.403	0.421	0.443	0.467	0.495
0.825	0.395	0.416	0.435	0.46	0.484	0.517
0.85	0.41	0.432	0.454	0.481	0.508	0.541
0.87	0.426	0.448	0.472	0.502	0.531	0.567
0.89	0.444	0.469	0.496	0.528	0.561	0.601
0.91	0.47	0.497	0.527	0.563	0.601	0.647
0.93	0.505	0.537	0.571	0.615	0.658	0.714
0.95	0.562	0.6	0.641	0.698	0.753	0.826
0.96	0.609	0.653	0.703	0.775	0.839	0.927
0.97	0.685	0.74	0.806	0.889	0.974	1.086
0.98	0.786	0.853	0.959	1.052	1.183	1.361

(Continued on next page)

*Corresponding author: matthew.edwards@matelys.com

Table 5. (Continued)

	a/r_W [-]					
	0.0103	0.0127	0.0156	0.0192	0.0236	0.029
r_A/r_W [-]						
0.05	0.041	0.043	0.047	0.049	0.046	0.056
0.15	0.14	0.144	0.152	0.158	0.165	0.171
0.25	0.231	0.24	0.251	0.263	0.276	0.291
0.35	0.309	0.323	0.338	0.355	0.374	0.395
0.45	0.37	0.389	0.408	0.43	0.454	0.481
0.55	0.415	0.435	0.459	0.486	0.515	0.548
0.65	0.449	0.473	0.502	0.532	0.567	0.608
0.75	0.492	0.522	0.554	0.596	0.638	0.689
0.8	0.526	0.559	0.6	0.644	0.695	0.757
0.825	0.548	0.586	0.629	0.679	0.737	0.804
0.85	0.577	0.619	0.667	0.723	0.787	0.865
0.87	0.607	0.654	0.707	0.768	0.842	0.93
0.89	0.645	0.697	0.759	0.829	0.914	1.02
0.91	0.698	0.761	0.83	0.916	1.015	1.136
0.93	0.776	0.854	0.941	1.047	1.175	1.331
0.95	0.911	1.011	1.135	1.284	1.464	1.694
0.96	1.024	1.144	1.293	1.489	1.73	2.026
0.97	1.192	1.364	1.572	1.846	2.183	2.598
0.98	1.555	1.821	2.154	2.61	3.127	3.829
	a/r_W [-]					
	0.0357	0.0438	0.0539	0.0662	0.0814	0.1
r_A/r_W [-]						
0.05	0.055	0.055	0.053	0.061	0.074	0.061
0.15	0.179	0.19	0.201	0.213	0.227	0.24
0.25	0.305	0.326	0.342	0.366	0.391	0.419
0.35	0.418	0.444	0.474	0.506	0.542	0.586
0.45	0.511	0.545	0.584	0.629	0.68	0.739
0.55	0.586	0.628	0.679	0.735	0.801	0.878
0.65	0.653	0.706	0.767	0.841	0.929	1.03
0.75	0.75	0.817	0.899	1.001	1.123	1.263
0.8	0.828	0.913	1.016	1.14	1.293	1.48
0.825	0.885	0.979	1.098	1.242	1.422	1.638
0.85	0.957	1.064	1.198	1.362	1.569	1.832
0.87	1.034	1.16	1.314	1.507	1.752	2.07
0.89	1.143	1.292	1.478	1.708	2.014	2.407
0.91	1.284	1.468	1.701	1.998	2.387	2.898
0.93	1.527	1.771	2.09	2.499	3.036	3.749
0.95	1.987	2.36	2.839	3.472	4.301	5.412
0.96	2.406	2.892	3.54	4.376	5.491	6.954
0.97	3.149	3.842	4.761	5.93	7.515	9.699
0.98	4.726	5.838	7.325	9.28	11.923	15.805

Cite this article as: Edwards M, Chevillotte F, Bécot F-X, Jaouen L & Totaro N. 2021. Addendum to “Polynomial relations for cylindrical wheel stiffness characterization for use in a rolling noise prediction model”. Acta Acustica, 5, 5.