



## Correction to: Influence of Layup Sequence on the Surface Accuracy of Carbon Fiber Composite Space Mirrors

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Published online: 6 December 2018  
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### Correction to: Appl Compos Mater

<https://doi.org/10.1007/s10443-018-9690-4>

The original version of this article unfortunately contained mistakes. Below is a list of corrections. The red color font is the final correct text after the modification. Several images in the article that need to be changed are already marked below.

**1. Table 3 was incorrect in the Original Paper. The corrected Table 3 is given next page:**

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The online version of the original article can be found at <https://doi.org/10.1007/s10443-018-9690-4>

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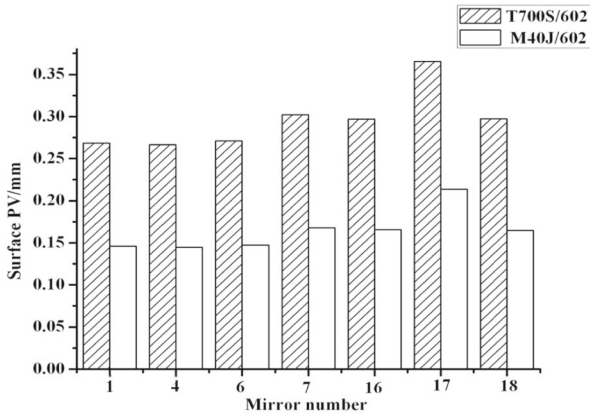
**Table 3** Surface figures of simulated composite space mirrors with varied layup sequences

No.	Material	Angular increment $\rho$	Number of fiber orientation angles	Lamina thickness /mm	Number of symmetric sequences	Number of plies	Stacking sequence	Surface PV/mm
01-1	T700S/E602	60	3	0.10	4	24	[60/0/-60] <sub>AS</sub>	0.2685
02-1		45	4	0.15	2	16	[45/0/-45/90] <sub>2S</sub>	0.4129
03-1							[45/-45/0/90] <sub>2S</sub>	0.4830
04-1				0.10	3	24	[45/0/-45/90] <sub>3S</sub>	0.2667
05-1				0.075	4	32	[45/0/-45/90] <sub>4S</sub>	0.1971
06-1		30	6	0.10	2	24	[0/30/60/90/-60/-30] <sub>2S</sub>	0.2710
07-1						24	[0/90/30/-60/60/-30] <sub>2S</sub>	0.3022
08-1		22.5	8	0.15	1	16	[22.5/90/-45/-22.5/67.5/-67.5/0/45] <sub>S</sub>	0.4057
09-1							[0/22.5/45/67.5/90/-67.5/-45/-22.5] <sub>S</sub>	0.4484
10-1							[0/90/22.5/-67.5/45/-45/67.5/-22.5] <sub>S</sub>	0.5682
11-1							[0/90/45/-45/22.5/-67.5/67.5/-22.5] <sub>S</sub>	0.4491
12-1				0.075	2	32	[22.5/90/-45/-22.5/67.5/-67.5/0/45] <sub>2S</sub>	0.1928
13-1							[0/22.5/45/67.5/90/-67.5/-45/-22.5] <sub>2S</sub>	0.2019
14-1							[0/90/22.5/-67.5/45/-45/67.5/-22.5] <sub>2S</sub>	0.2214
15-1							[0/90/45/-45/22.5/-67.5/67.5/-22.5] <sub>2S</sub>	0.2018
16-1		15	12	0.10	1	24	[0/15/30/45/60/75/90/-75/-60/-45/-30/-15] <sub>S</sub>	0.2967
17-1							[0/90/15/-75/30/-60/45/-45/60/-30/75/-15] <sub>S</sub>	0.3656
18-1							[0/90/45/-45/15/-75/75/-15/30/-60/60/-30] <sub>S</sub>	0.2974
19-1		11.25	16	0.075	1	32	[0/11.25/22.5/33.75/45/56.25/67.5/78.75/90/-78.75/-67.5/-56.25/-45/-33.75/-22.5/-11.25] <sub>S</sub>	0.2215
20-1						[0/90/11.25/-78.75/22.5/-67.5/33.75/-56.25/45/-45/56.25/-33.75/67.5/22.5/78.75/-11.25] <sub>S</sub>	0.2694	
21-1						[0/90/45/-45/11.25/-78.75/56.25/-33.75/22.5/-67.5/67.5/-22.5/33.75/-56.25/78.75/-11.25] <sub>S</sub>	0.2019	
01-2	M40J/E602	60	3	0.10	4	24	[60/0/-60] <sub>AS</sub>	0.1457
02-2		45	4	0.15	2	16	[+45/0/-45/90] <sub>2S</sub>	0.2260
03-2							[+45/-45/0/90] <sub>2S</sub>	0.2726
04-2				0.10	3	24	[+45/0/-45/90] <sub>3S</sub>	0.1445
05-2				0.075	4	32	[+45/0/-45/90] <sub>4S</sub>	0.1063
06-2		30	6	0.10	2	24	[0/30/60/90/-60/-30] <sub>2S</sub>	0.1474
07-2						24	[0/90/30/-60/60/-30] <sub>2S</sub>	0.1678

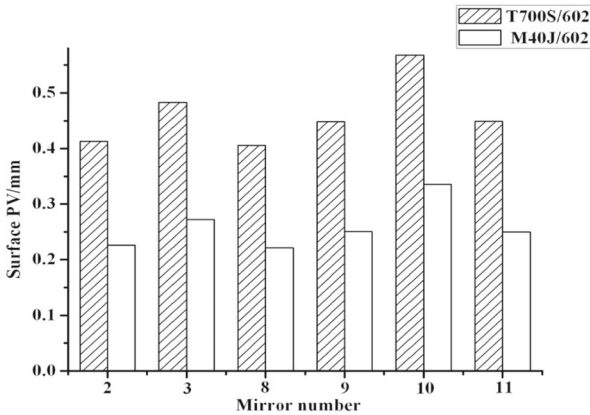
**Table 3** (continued)

No.	Material	Angular increment $\rho$	Number of fiber orientation angles	Lamina thickness /mm	Number of symmetric sequences	Number of plies	Stacking sequence	Surface PV/mm
08-2		22.5	8	0.15	1	16	[22.5/90/-45/-22.5/67.5/-67.5/0/45]s	0.2213
09-2							[0/22.5/45/67.5/90/-67.5/-45/-22.5]s	0.2510
10-2							[0/90/45/-45/22.5/-67.5/67.5/-22.5]s	0.3356
11-2							[0/90/22.5/-67.5/45/-45/67.5/-22.5]s	0.2498
12-2				0.075	2	32	[22.5/90/-45/-22.5/67.5/-67.5/0/45]s	0.1036
13-2							[0/22.5/45/67.5/90/-67.5/-45/-22.5]s	0.1095
14-2							[0/90/22.5/-67.5/45/-45/67.5/-22.5]s	0.1222
15-2							[0/90/45/-45/22.5/-67.5/67.5/-22.5]s	0.1093
16-2		15	12	0.10	1	24	[0/15/30/45/60/75/90/-75/-60/-45/-30/-15]s	0.1654
17-2							[0/90/15/-75/30/-60/45/-45/60/-30/75/-15]s	0.2136
18-2							[0/90/45/-45/15/-75/75/-15/30/-60/60/-30]s	0.1645
19-2		11.25	16	0.075	1	32	[0/11.25/22.5/33.75/45/56.25/67.5/78.75/90/-78.75/-67.5/-56.25/-45/-33.75/-22.5/-11.25]s	0.1233
20-2							[0/90/11.25/-78.75/22.5/-67.5/33.75/-56.25/45/-45/56.25/-33.75/67.5/-22.5/78.75/-11.25]s	0.1567
21-2							[0/90/45/-45/11.25/-78.75/56.25/-33.75/22.5/-67.5/67.5/-22.5/33.75/-56.25/78.75/-11.25]s	0.1094

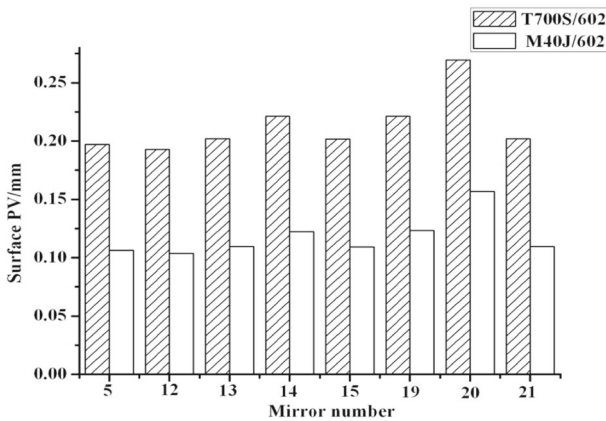
2. Figure 1 was incorrect. The corrected Figure 1 is given below:



(a) 0.10mm

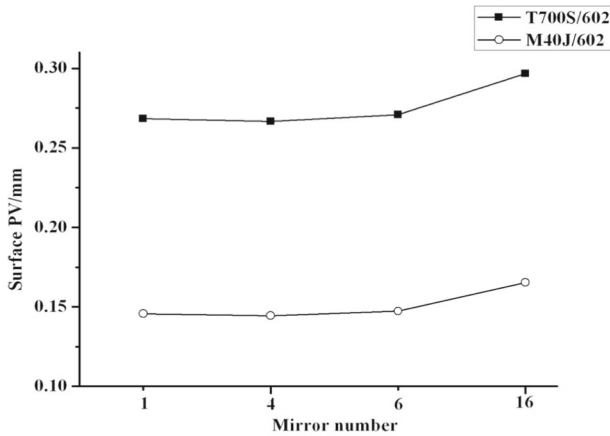


(b) 0.15mm

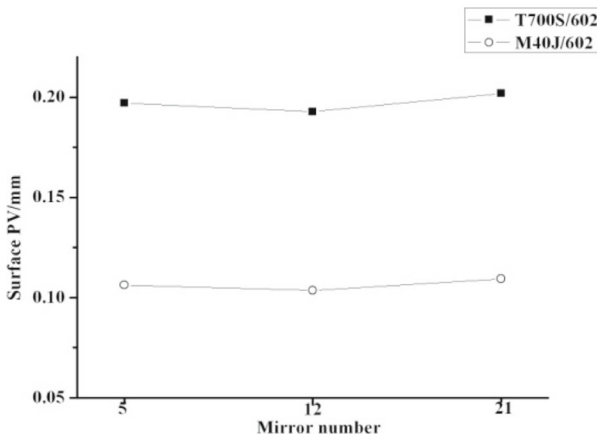


(c) 0.075mm

3. Figure 2 was incorrect. The corrected Figure 2 is given below:



(a) 0.10mm



(b) 0.075mm

4. In the second line of the eighth paragraph of Section 4.2 (page 11):

“We can found that, the surface PV values of composite mirrors decrease with the increase of number of symmetric sequences in the case of one angular deviation in the stacking sequences, and so the surface precision of composite mirrors get improved.” was changed to “We can found that, the surface PV values of composite mirrors decrease firstly and then increase with the increase of number of symmetric sequences in the case of one angular deviation in the stacking sequences.”

5. In the fifth line of the eighth paragraph of Section 4.2 (page 12):

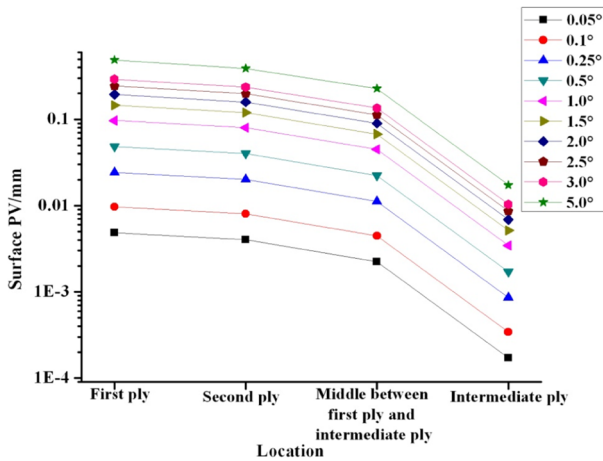
“Comparing with angular increments reduction, adding number of symmetric sequences can obviously improve bending stiffness and surface precision of composite mirrors.” was changed to

“Comparing with angular increments reduction, adding number of symmetric sequences properly can obviously improve bending stiffness and surface precision of composite mirrors, but increasing the number of symmetric sequences excessively cannot further enhance the bending stiffness of composite mirrors.”

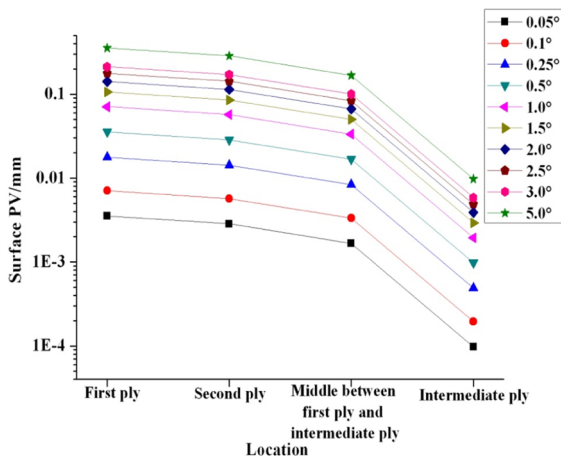
**6. In the sixth line of the tenth paragraph of Section 4.2 (page 12):**

“Increasing number of symmetric sequence plays an obvious role in improving surface figures of composite mirror,” was changed to “Increasing number of symmetric sequence properly plays an obvious role in improving surface figures of composite mirror,”

**7. Figure 3 was incorrect. The corrected Figure 3 is given below:**



(a) [60/0/-60]<sub>4S</sub>



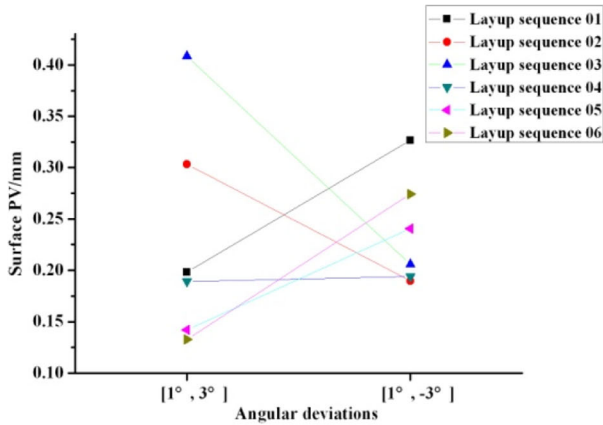
(b) [45/0/-45/90]<sub>4S</sub>

**8. Table 5 was incorrect in the Original Paper. The corrected Table 5 is given below:**

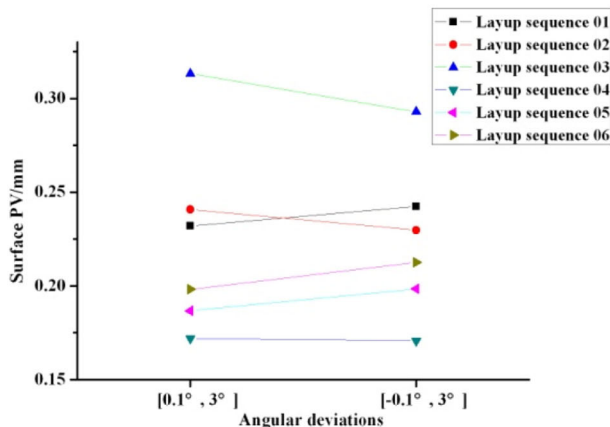
**Table 5** Surface figures of composite space mirrors for the six typical layup sequences with the angular deviations on the first ply

No.	Angular deviation value/°	Surface PV/mm					
		Layup sequence 01	Layup sequence 02	Layup sequence 03	Layup sequence 04	Layup sequence 05	Layup sequence 06
01	0.05	0.0048	0.0049	0.0055	0.0035	0.0035	0.0036
02	0.1	0.0097	0.0098	0.0109	0.0071	0.0069	0.0073
03	0.25	0.0242	0.0245	0.0273	0.0177	0.0173	0.0182
04	0.5	0.0485	0.0490	0.0547	0.0355	0.0346	0.0364
05	1	0.0970	0.0981	0.1099	0.0709	0.0691	0.0728
06	1.5	0.1457	0.1474	0.1654	0.1063	0.1036	0.1094
07	2	0.1945	0.1968	0.2214	0.1418	0.1380	0.1461
08	2.5	0.2434	0.2463	0.2777	0.1772	0.1723	0.1829
09	3	0.2925	0.2960	0.3344	0.2126	0.2066	0.2198
10	5	0.4894	0.4956	0.5646	0.3538	0.3429	0.3682

**9. Figure 4 was incorrect. The corrected Figure 4 is given below:**

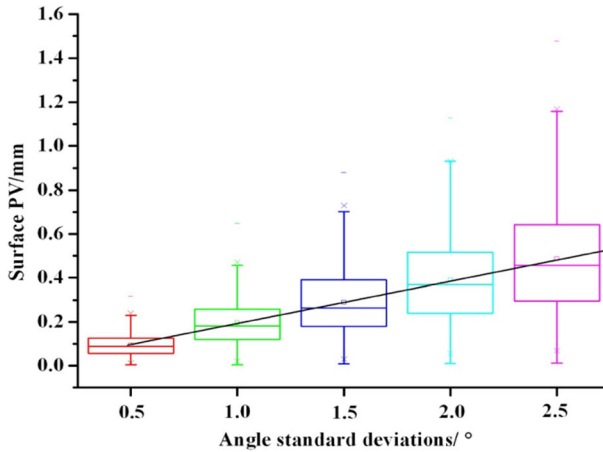


(a)  $[1^\circ, 3^\circ], [1^\circ, -3^\circ]$

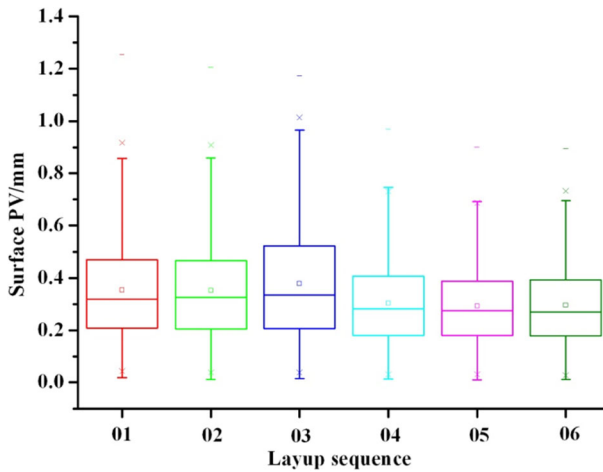


(b)  $[0.1^\circ, 3^\circ], [-0.1^\circ, 3^\circ]$

10. Figure 5 was incorrect. The corrected Figure 5 is given below:



11. Figure 6 was incorrect. The corrected Figure 6 is given below:



12. Table 6 was incorrect in the Original Paper. The corrected Table 6 is given below:

**Table 6** Characteristic values of surface figures of composite space mirrors for six typical layup sequences with random angular deviations

No.	Angle standard deviation/°	Type	Characteristic surface PV values/mm					
			Layup sequence 01	Layup sequence 02	Layup sequence 03	Layup sequence 04	Layup sequence 05	Layup sequence 06
01	1.5	First quartile	0.2085	0.2053	0.2082	0.1809	0.1804	0.1784
02		Median	0.3195	0.3263	0.3346	0.2824	0.2752	0.2698
03		Third quartile	0.4697	0.4671	0.5227	0.4068	0.3885	0.3928
04		Minimum	0.0183	0.0109	0.0156	0.0134	0.0099	0.0116



**13 In the fifteenth paragraph of Section 5.2 (page 18):**

“Median and minimum of surface PV values for layup sequence 05 are the lowest, and so the surface accuracy of composite mirror placed with layup sequence 05 is relative best here.” was changed to “Third quartile and minimum of surface PV values for layup sequence 05 are the lowest, while first quartile and median of surface PV values for layup sequence 06 are the lowest. Compared to layup sequence 06, composite mirrors placed with layup sequence 05 are less affected by random angular deviation, and so the surface accuracy of composite mirrors placed with layup sequence 05 is relative best here.”

**14 In the second line of item no.2 of the Conclusions section (page 19):**

“To further improve surface precision of composite mirror, increasing number of symmetric sequence plays an obvious role in improving surface figures of mirror” was changed to “To further improve surface precision of composite mirror, increasing number of symmetric sequence properly plays an obvious role in improving surface figures of mirror”

The original article has been corrected.