

Supplementary Data label and legend

Supplementary Data 1 is the original data of Figure 3(a) which displays the evaluation history of the objective function in the manuscript. Data 1 reveals that the root mean square (RMS) value of the beam tip deflection varies with the number of iterations when the beam vibrates freely. The first column of Data 1 is the numbers of iterations. The second column of Data 1 is the RMS values of the beam tip deflection when the beam vibrates freely.

Supplementary Data 2 is the original data of Figure 3(b) which displays the time history of tip deflection in the manuscript. Data 2 shows that the beam tip deflection varies with time before and after optimization when the beam vibrates freely. The first column of Data 2 is the time. The second column of Data 2 is the beam tip deflection varies with time when the beam vibrates freely without optimal DVA. The third column of Data 2 is the beam tip deflection varies with time when the beam vibrates freely with optimal DVA.

Supplementary Data 3 is the original data of Figure 4(a) which displays the evaluation history of the objective function in the manuscript. Data 3 shows that the RMS value of the beam tip deflection varies with the number of iterations when the beam subjected to a half-sine pulse excitation. The first column of Data 3 is the numbers of iterations. The second column of Data 3 is the RMS values of the beam tip deflection when the beam subjected to a half-sine pulse excitation.

Supplementary Data 4 is the original data of Figure 4(b) which displays the time history of tip deflection in the manuscript. Data 4 shows that the beam tip deflection varies with time before and after optimization when the beam subjected to a half-sine pulse excitation. The first column of Data 4 is the time. The second column of Data 4 is the beam tip deflection varies with time when the beam subjected to a half-sine pulse excitation without optimal DVA. The third column of Data 4 is the beam tip deflection varies with time when the beam subjected to a half-sine pulse excitation with optimal DVA.

Supplementary Data 5 is the original data of Figure 5(a) which displays the evaluation history of the objective function in the manuscript. Data 5 shows that the RMS value of the beam tip deflection varies with the number of iterations when the beam under harmonic excitation. The first column of Data 5 is the numbers of iterations. The second column of Data 5 is the RMS values of the beam tip deflection when the beam under harmonic excitation.

Supplementary Data 6 is the original data of Figure 5(b) which displays the time history of tip deflection in the manuscript. Data 6 shows that the beam tip deflection varies with time before and after optimization when the beam under harmonic excitation. The first column of Data 6 is the time. The second column of Data 6 is the beam tip deflection varies with time when the beam under harmonic excitation without optimal DVA. The third column of Data 6 is the beam tip deflection varies with time when the beam under harmonic excitation with optimal DVA.