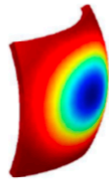


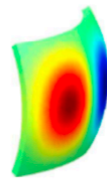


Professor Bin Qin

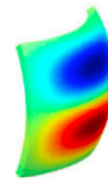
Toro-circular panel ($R_0=1.5$): $\phi=60^\circ$



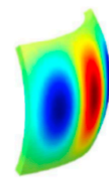
1st mode



2nd mode

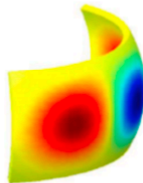


3rd mode

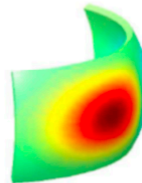


4th mode

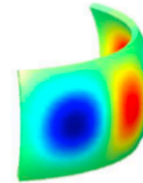
Toro-circular panel ($R_0=1.5$): $\phi=120^\circ$



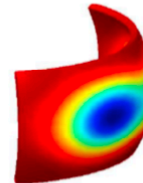
1st mode



2nd mode

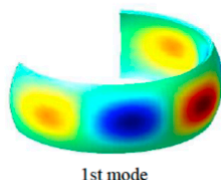


3rd mode

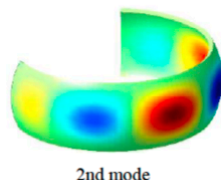


4th mode

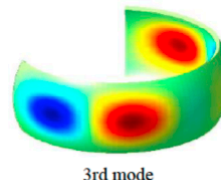
Toro-circular panel ($R_0=1.5$): $\phi=240^\circ$



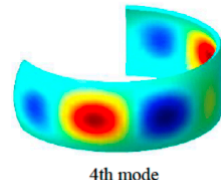
1st mode



2nd mode

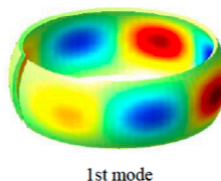


3rd mode

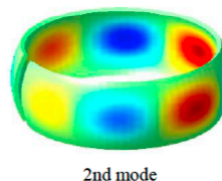


4th mode

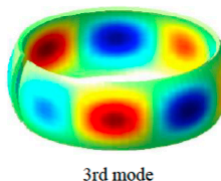
Toro-circular panel ($R_0=1.5$): $\phi=350^\circ$



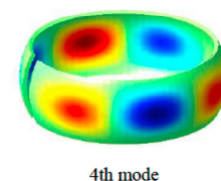
1st mode



2nd mode



3rd mode



4th mode

From: Hong Zhang, Dongyan Shi, Qingshan Wang and Bin Qin, "Free vibration of functionally graded parabolic and circular panels with general boundary conditions", *Curved and Layered Structures*, Vol. 4, No. 1, pp 52-84, January 2017

See:

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Selected Publications:

Hong Zhang, Dongyan Shi, Qingshan Wang and Bin Qin, "Free vibration of functionally graded parabolic and circular panels with general boundary conditions", *Curved and Layered Structures*, Vol. 4, No. 1, pp 52-84, January 2017

Qingshan Wang, Bin Qin, Dongyan Shi and Qian Liang, "A semi-analytical method for vibration analysis of functionally graded carbon nanotube reinforced composite doubly-curved panels and shells of revolution", *Composite Structures*, Vol. 174, pp 87-109, August 2017

Qingshan Wang, Xiaohui Cui, Bin Qin and Qian Liang, "Vibration analysis of the functionally graded carbon nanotube reinforced composite shallow shells with arbitrary boundary conditions", *Composite Structures*, Vol. 182, pp 364-379, December 2017

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Bin Qin, Kwangnam Choe, Tiantian Wang and Qingshan Wang, "A unified Jacobi-Ritz formulation for vibration analysis of the stepped coupled structures of doubly-curved shell", *Composite Structures*, Vol. 220, pp 717-735, 15 July 2019

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