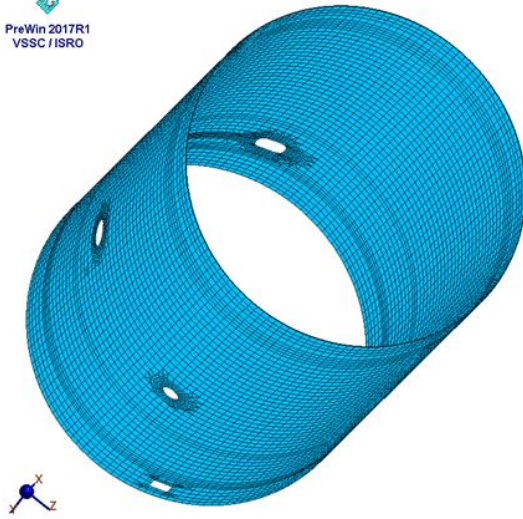


Free vibration analysis of a typical satellite core structure

PreWin 2017R1
VSSC / ISRO



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MODE SHAPE (Mode 1)
Frequency 115.111

Composite structure

Materials used

Material property :

1. $E_{11} = 72 \text{ GPa}$, $\nu = 0.33$, $\alpha = 2.3\text{E-}05$ Specific gravity = 2.8
2. $E_{11} = 0.01 \text{ GPa}$, $E_{22} = 0.01$, $\nu = 0.3$, Specific gravity = 3.2,
 $G_{12} = 0.01 \text{ GPa}$, $G_{13} = 0.18 \text{ GPa}$, $G_{23} = 0.08 \text{ GPa}$
3. $E_{11} = 246 \text{ GPa}$, $E_{22} = 8.1 \text{ GPa}$, $\nu = 0.27$,
Specific gravity = 1.615, $G_{12} = 5.2 \text{ GPa}$, $G_{13} = G_{23} = 0$
4. $E_{11} = 153 \text{ GPa}$, $E_{22} = 153 \text{ GPa}$, $\nu = 0.05$,
Specific gravity = 1.611, $G_{12} = 4.8 \text{ GPa}$, $G_{13} = G_{23} = 0$
5. $E_{11} = 24 \text{ GPa}$, $E_{22} = 24 \text{ GPa}$, $\nu = 0.15$, Specific gravity = 2,
 $G_{12} = 27 \text{ GPa}$, $G_{13} = G_{23} = 0$
6. $E_{11} = 147 \text{ GPa}$, $E_{22} = 147 \text{ GPa}$, $\nu = 0.03$,
Specific gravity = 1.66, $G_{12} = 4 \text{ GPa}$, $G_{13} = G_{23} = 0$
7. $E_{11} = 70 \text{ GPa}$, $\nu = 0.3$, Specific gravity = 3

Element types : Quadrilateral shell

Finite element statistics :	Number of elements	Number of nodes	Degrees of freedom
	8188	8137	48112

Mode	Natural frequencies, HZ	
	FEAST ^{SMT}	NASTRAN [®]
1	115.11	114.80
2	115.42	115.13
3	148.26	146.71