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# Dynamic Tuning of Thin-Walled Cylinders by Continuous Tow Shearing

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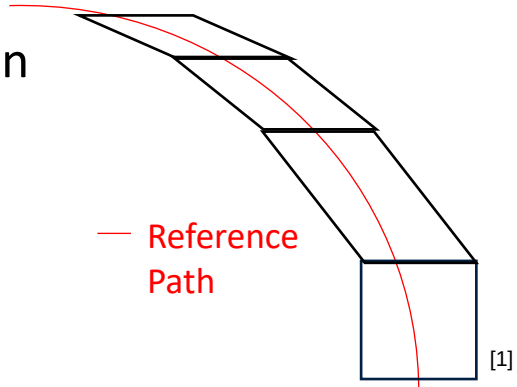
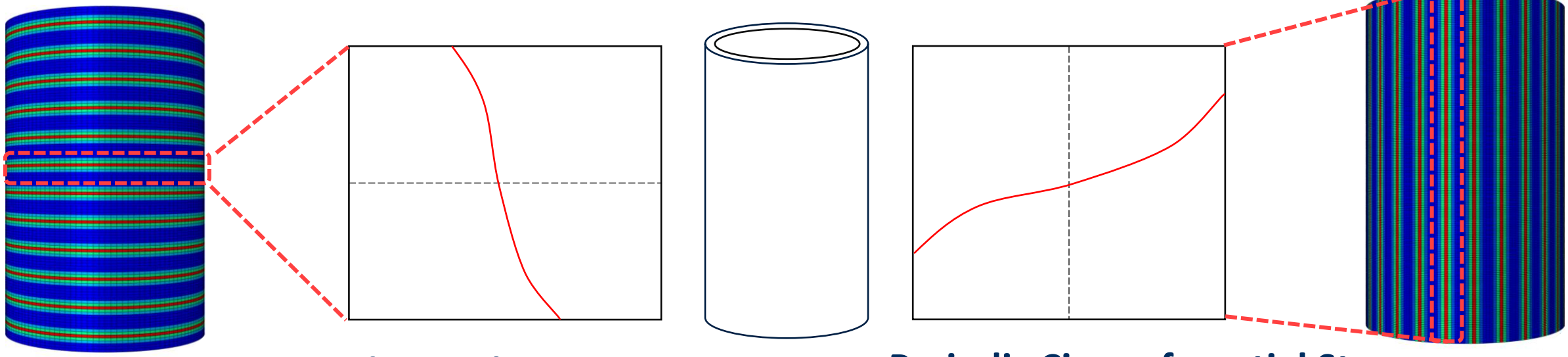
# Continuous Tow Sheared Cylinders

- Lightweight structures are identified as **key enabling technology** in next-generation aerospace vehicle design
- Continuous Tow Shearing (CTS) exhibits **orientation-thickness coupling** of steered material tows
- Periodic directional steering allows **embedded pseudo-stiffeners**



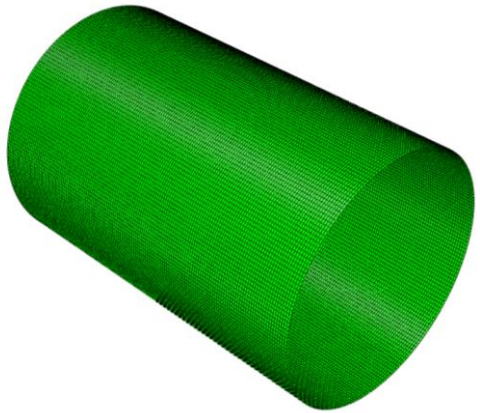



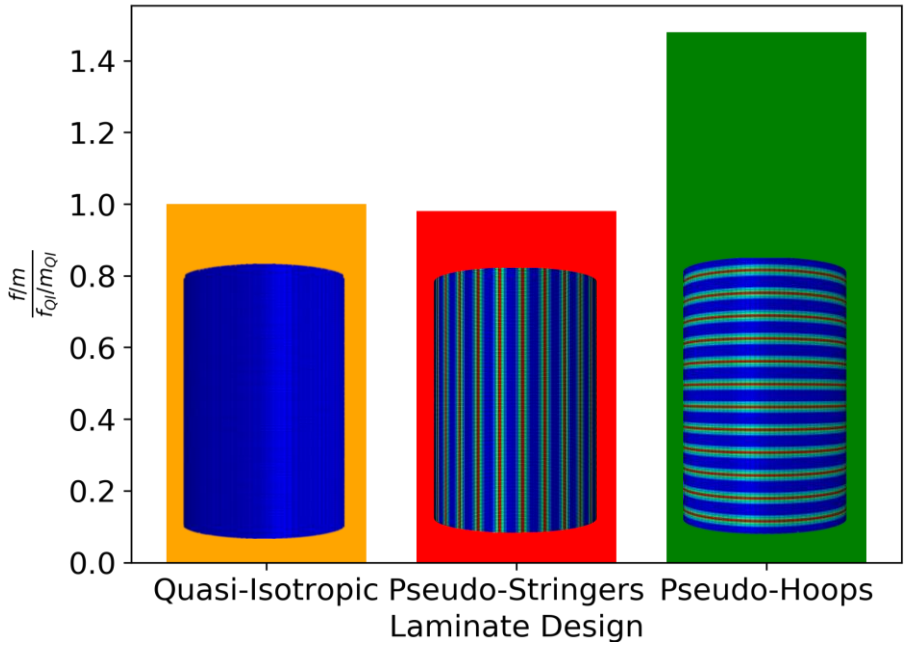
**Periodic Axial Steering**

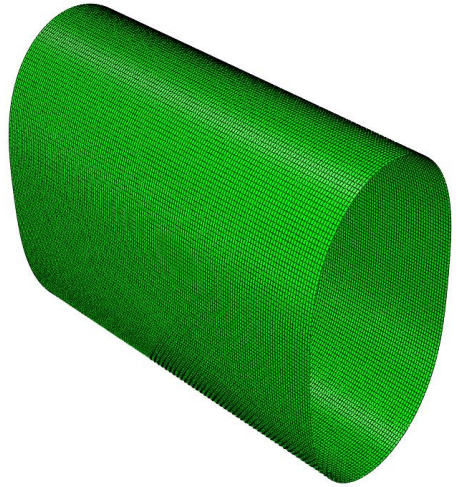
**Periodic Circumferential Steering**

# Improved Structural Efficiency

- Cylinders simulated under free-free boundary conditions in Abaqus CAE
- **Radially dominated deformations** at resonance
- Infer **structural preference to axial steering**
- 40% increase in performance





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# Questions at poster

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References

[1] B. C. Kim, K. Potter and P. M. Weaver, "Continuous tow shearing for manufacturing variable angle tow composites," Composites: Part A, vol. 43, pp. 1347-1356, 2012.