The establishment of a mechanics model of multi-strand wire rope subjected to bending load with finite element simulation and experimental verification

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Highlights：

- A general mechanics model of bending multi-strands wire rope is established.
- Calculation formulas of bending stiffness and equivalent elastic modulus are given.
- Secondary helix angle for wire ropes is periodic, and its change can be ignored.
- The equivalent elastic modulus of bending wire rope is independent of load type.
- The theory is verified by experimental measurement and FEA by ABAQUS.