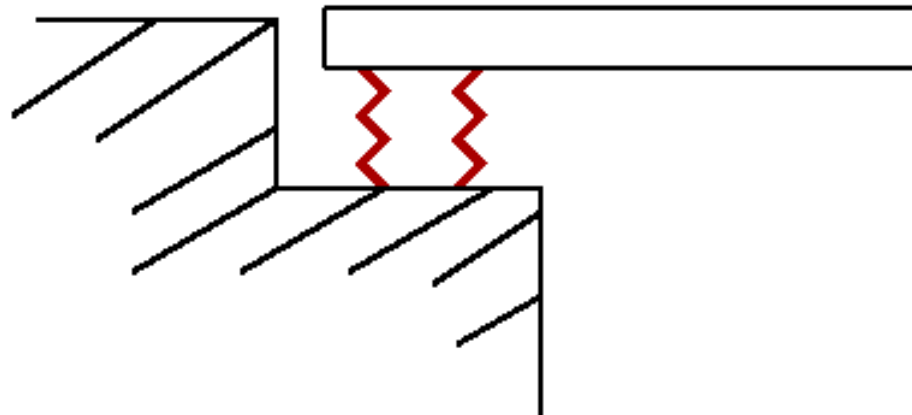
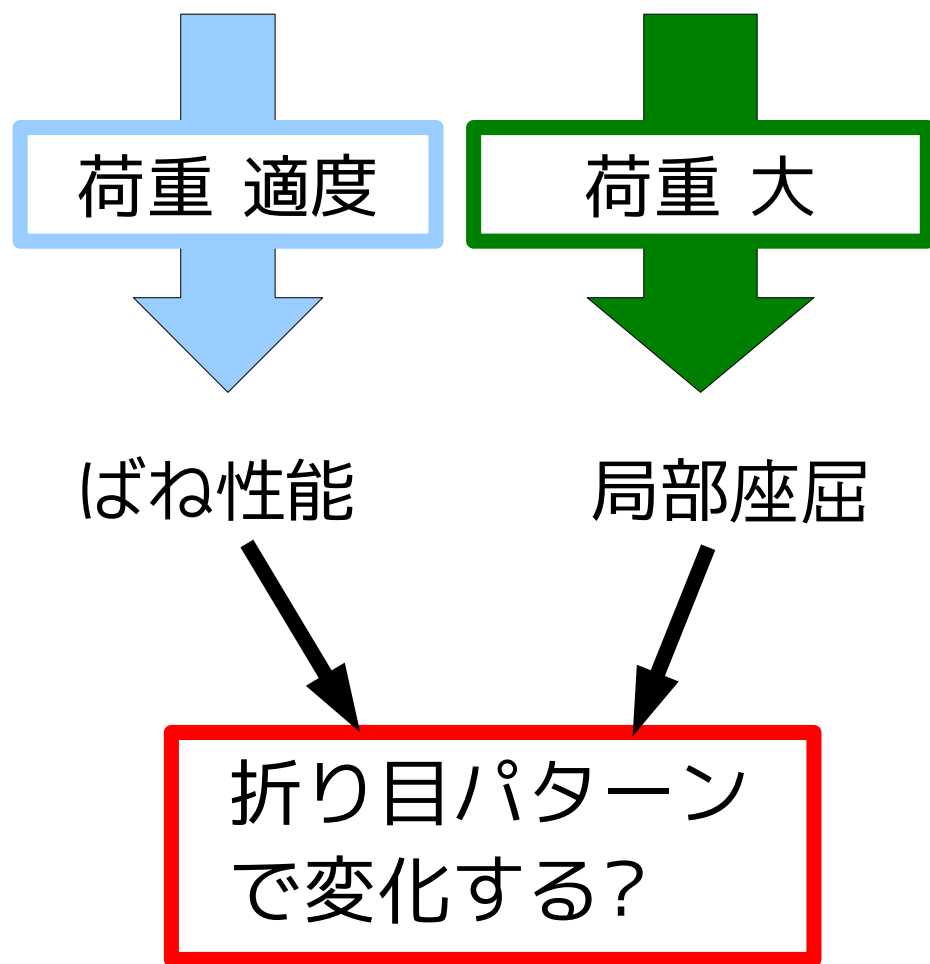


折り畳み円筒折り紙構造の挙動

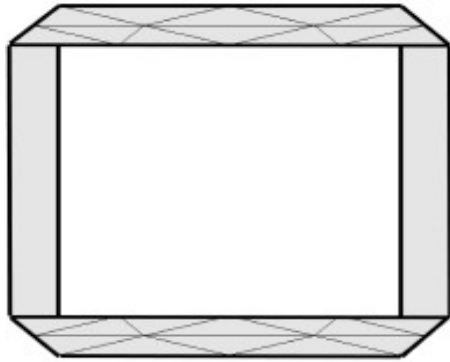
秋田大学 稲荷 優太郎

折り畳み型折り紙構造の有効利用

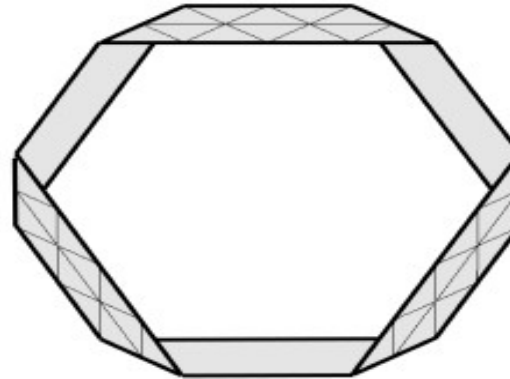


折り目パターン

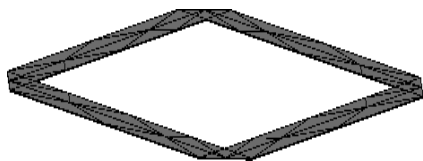
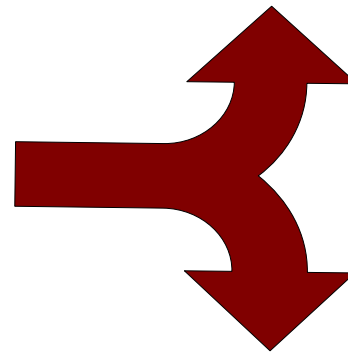
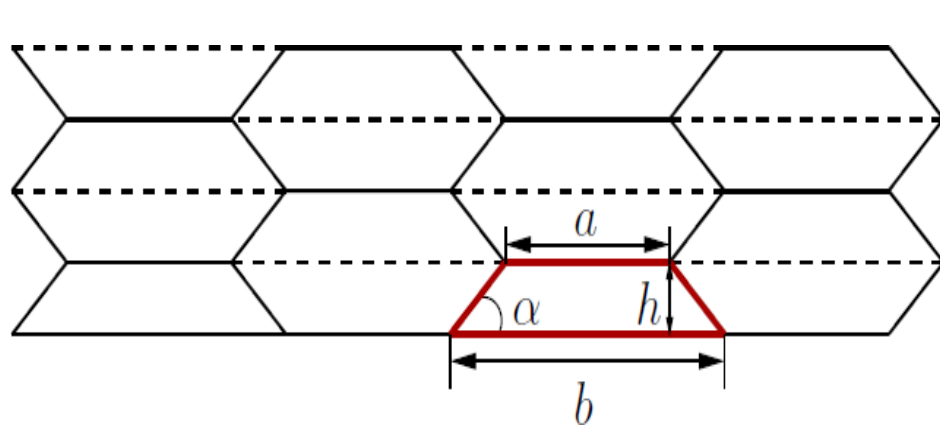
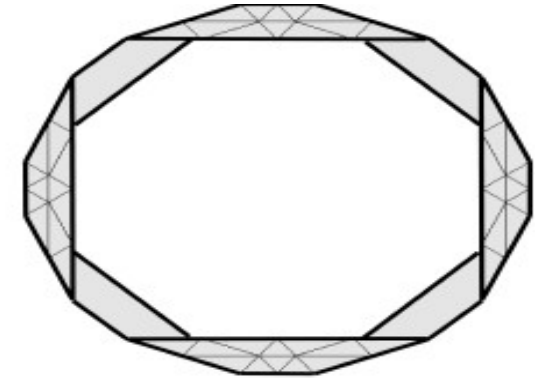
4角形



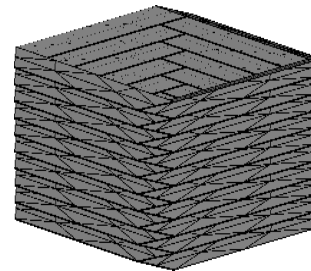
6角形



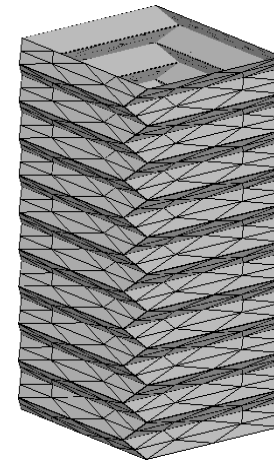
8角形



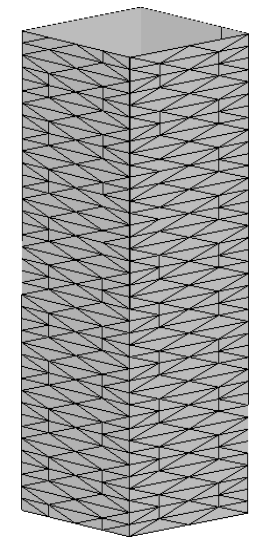
高さ 0



高さ 0.4



高さ 0.8



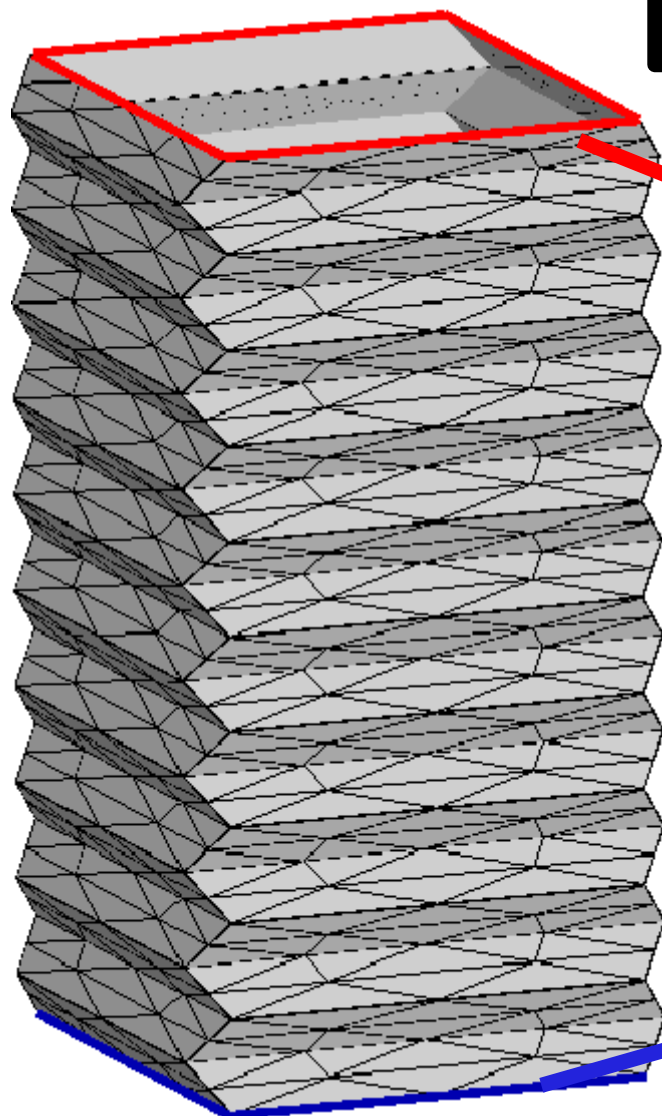
高さ 1

解析モデル



チューハイ缶ぐらいの
ヤング率と寸法

解析ツール
CalculiX

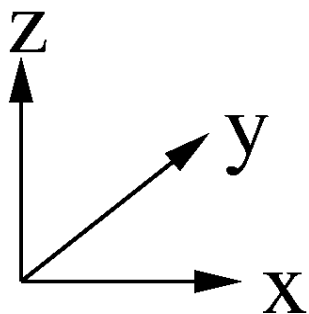


- ・ x, y の並進変位 拘束
- ・ 全節点に載荷

amplitude



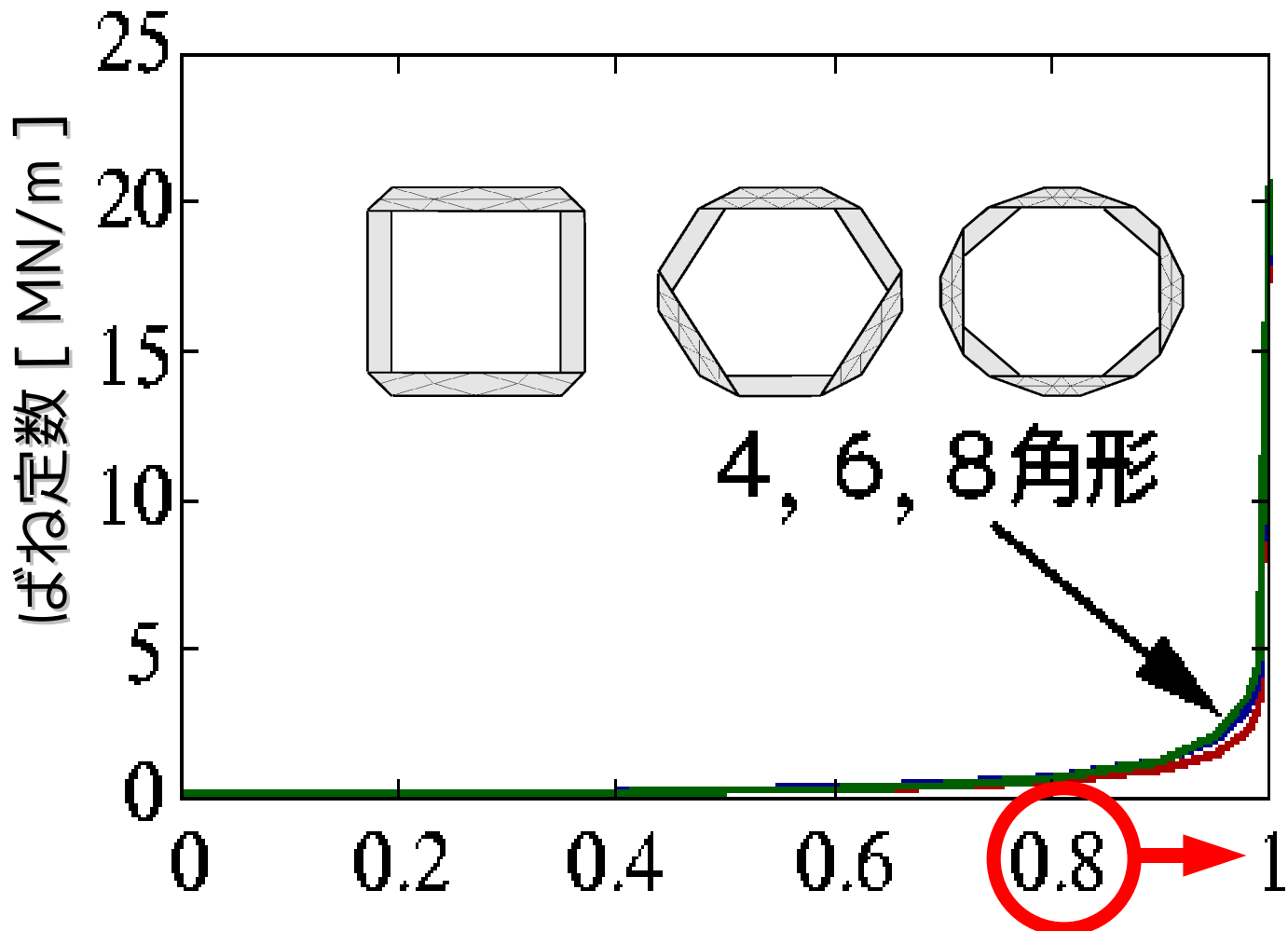
- ・ x, y, z の並進変位 拘束



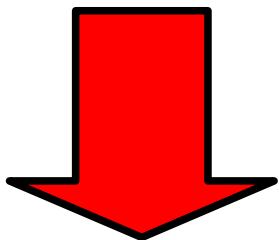
ばね定数の変化

$$\text{ばね定数} = \frac{\text{荷重}}{\text{変位}}$$

※引張も圧縮もばね定数同じ

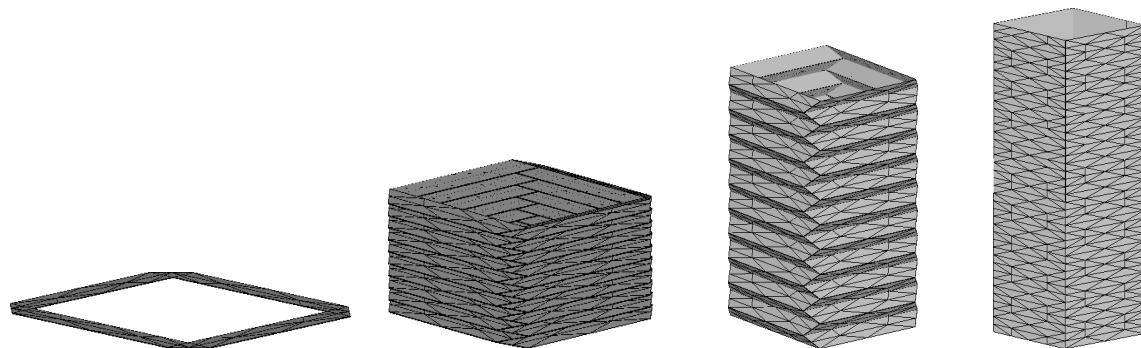


0.8hから硬くなる。



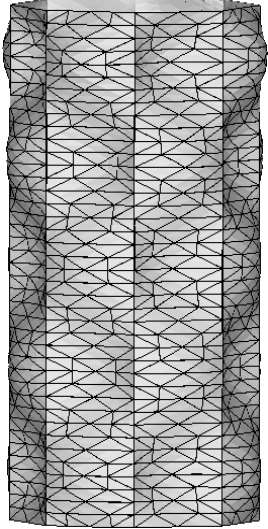
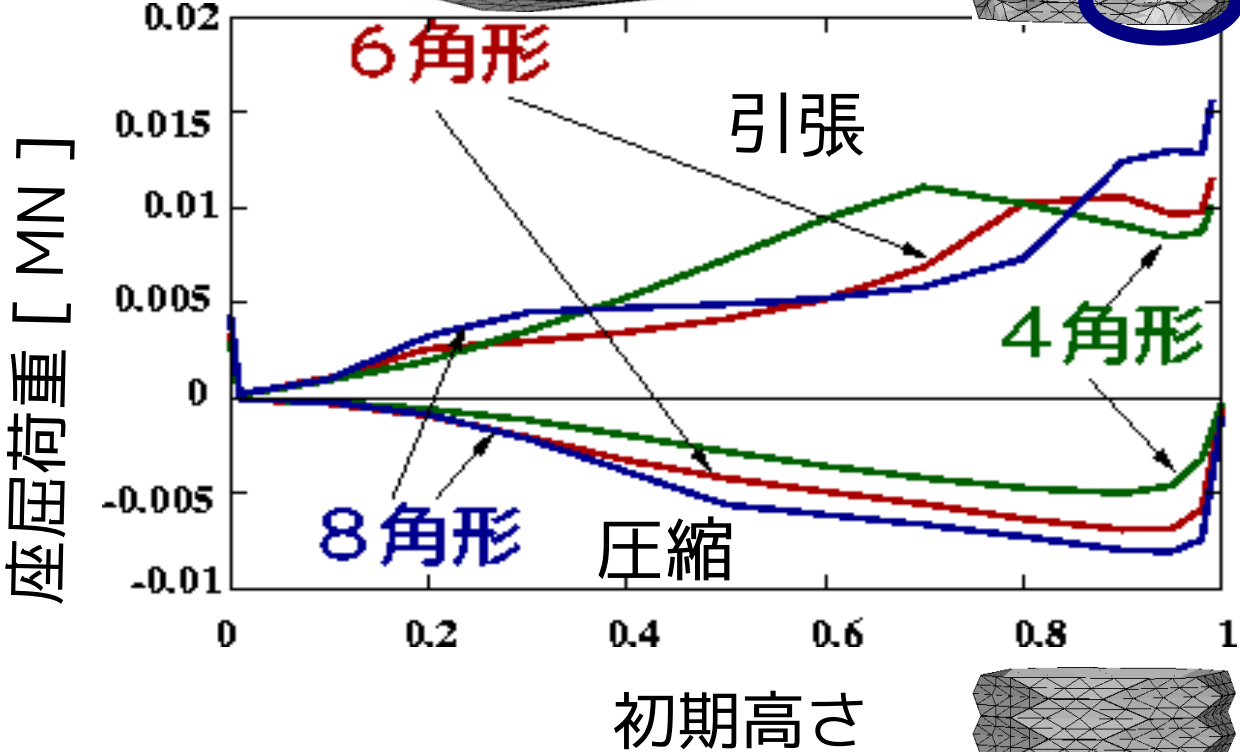
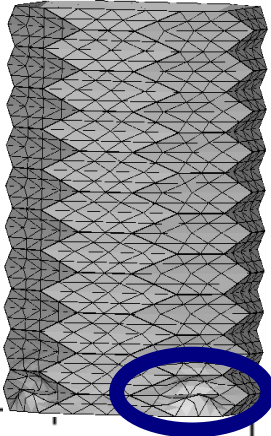
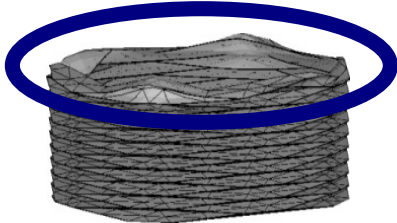
初期高さの影響 大

初期高さ

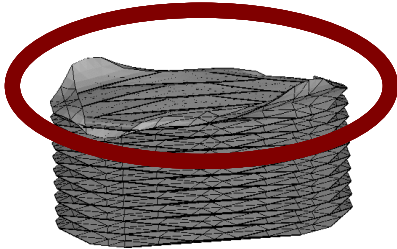


座屈荷重

引張の座屈モード



圧縮の座屈モード

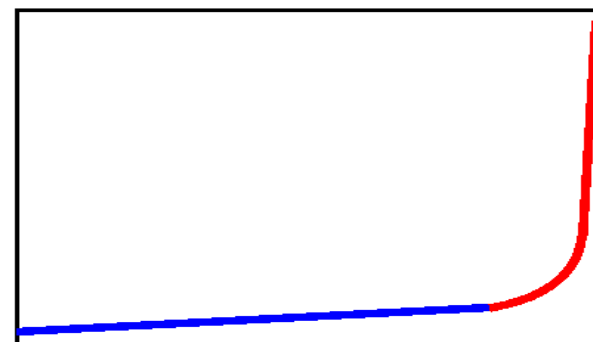


まとめ

ばね定数

- ・ 引張も圧縮も同じ

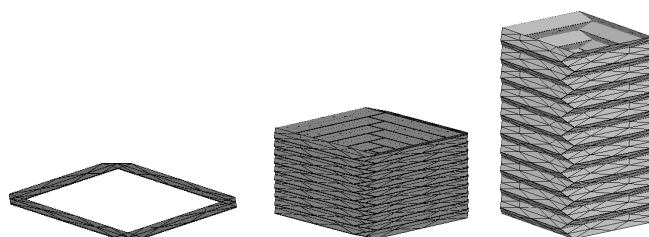
ばね



0.8h

- ・ 初期高さに依存 → 0.8h以下が使いやすい

座屈荷重



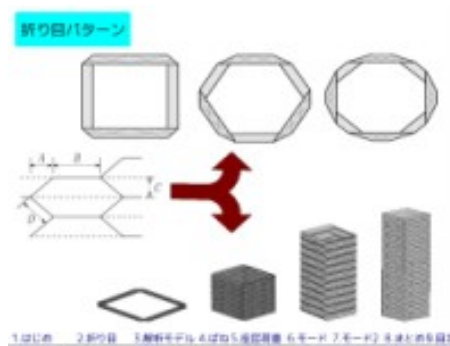
座屈荷重 大

目次

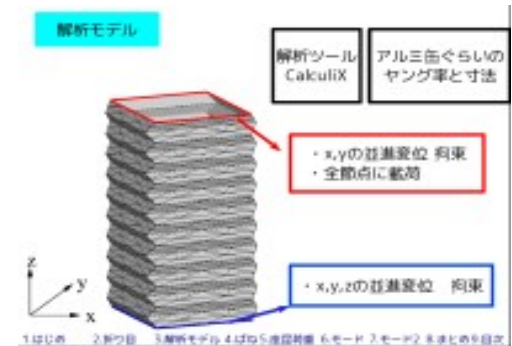
1.はじめに



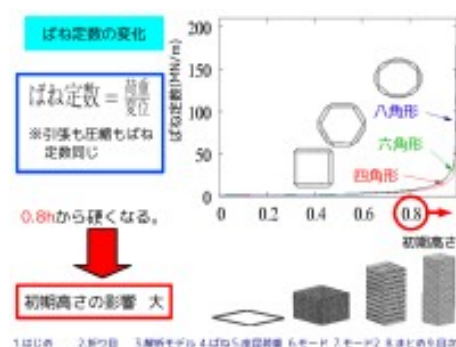
2.折り目パターン



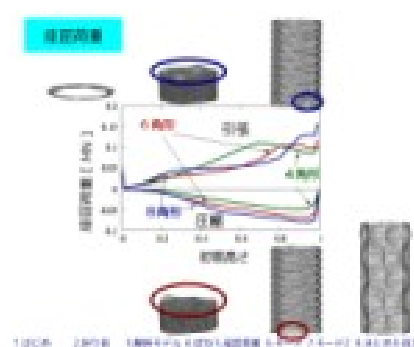
3.解析モデル



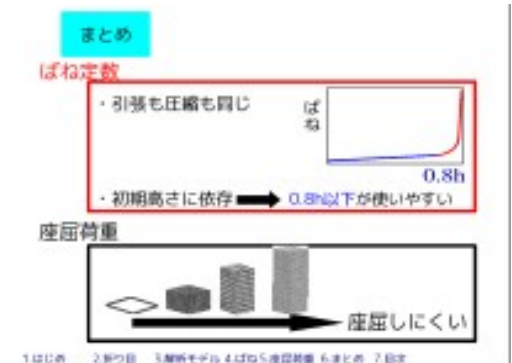
4.ばね定数



5.座屈荷重



6.まとめ



8.角数

9.要素数

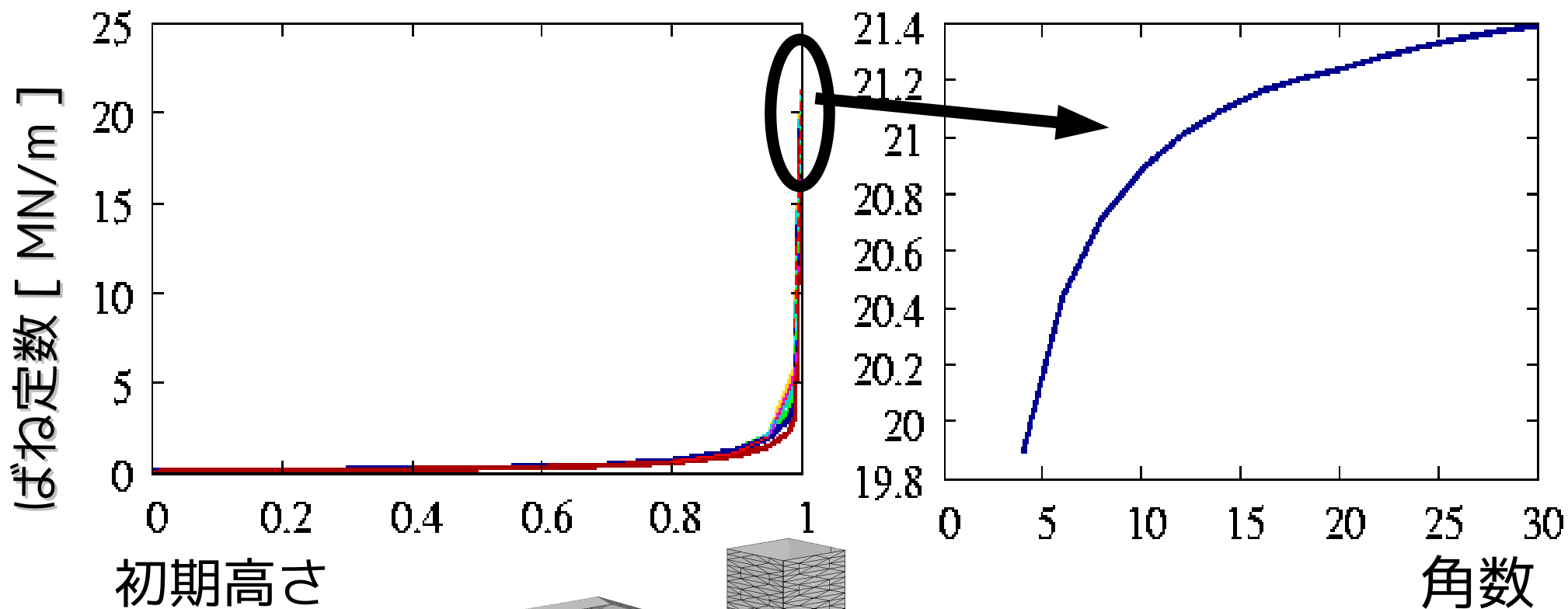
10.実験

11.引張座屈

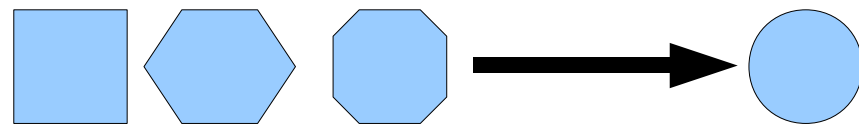
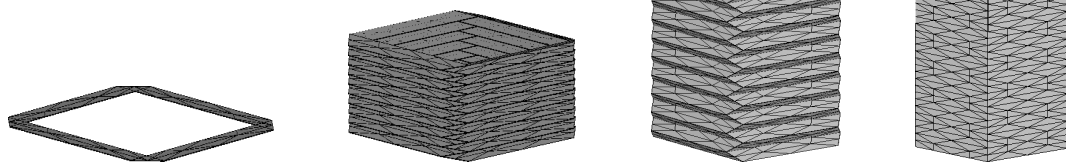
12.非線型

- 4~26角柱のばね定数

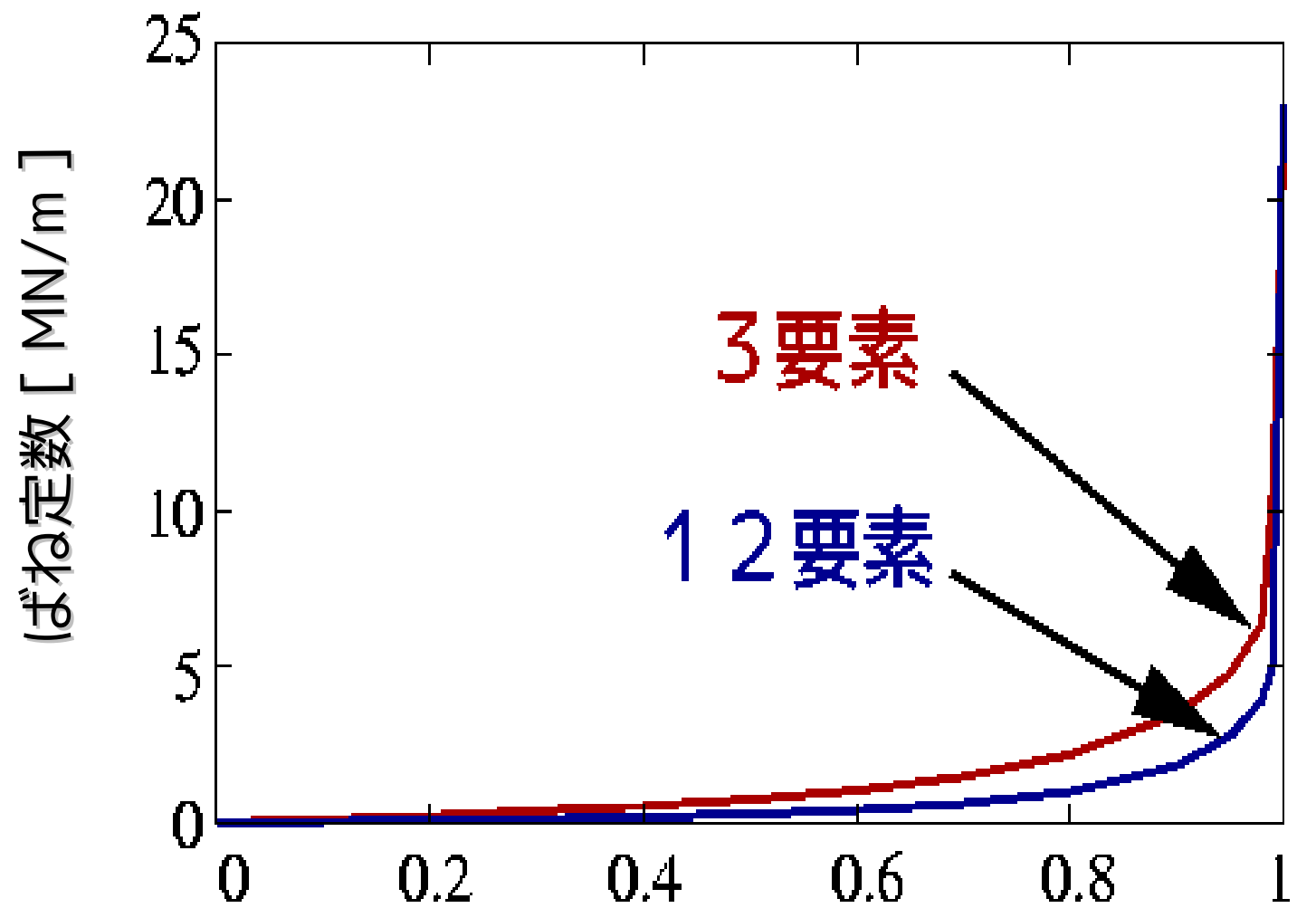
- 角柱のばね定数



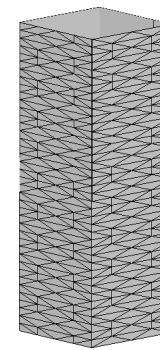
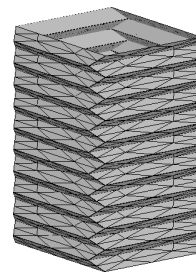
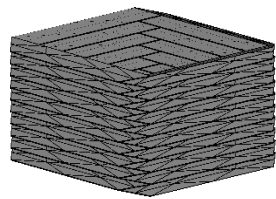
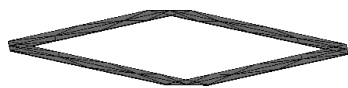
初期高さ



要素数による誤差



初期高さ



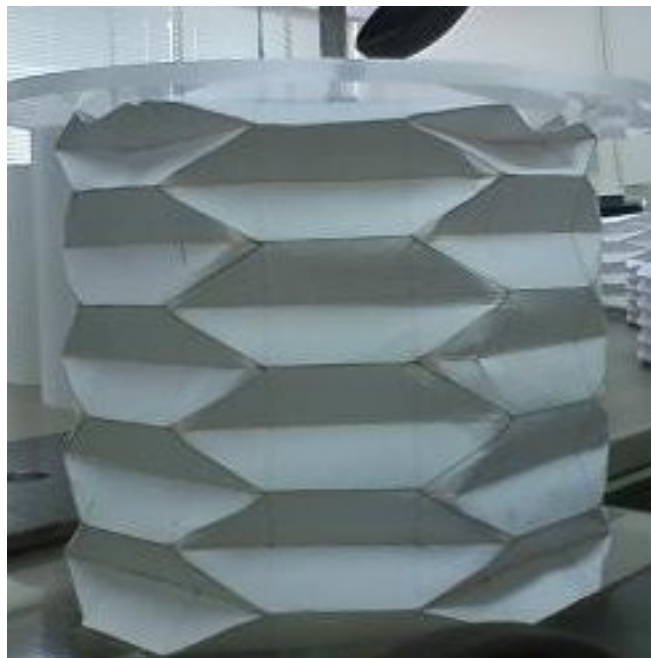
圧縮

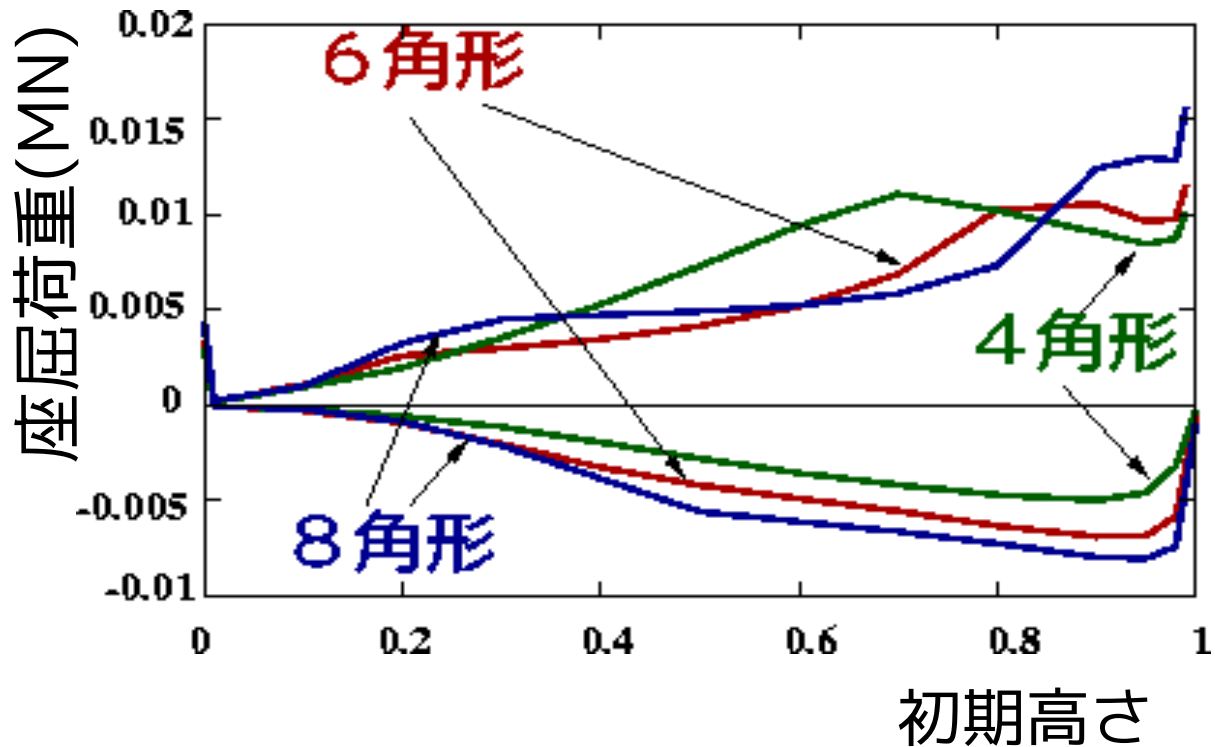


実験より

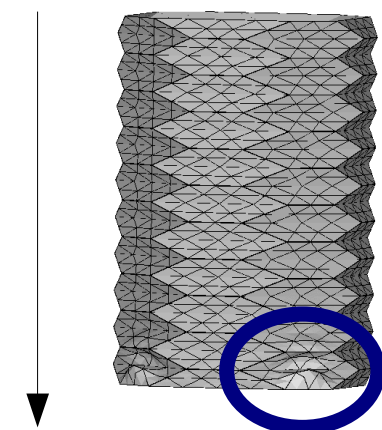


引張

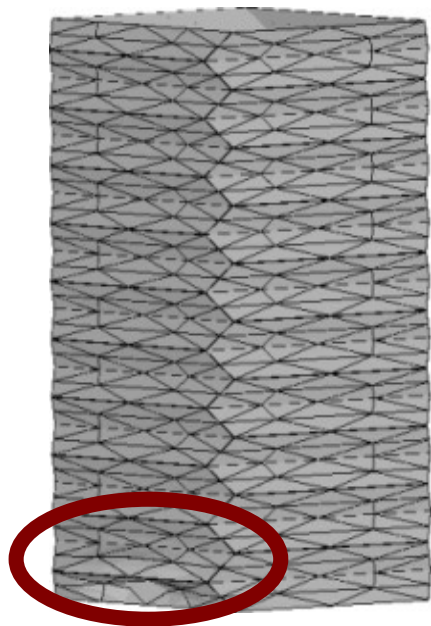




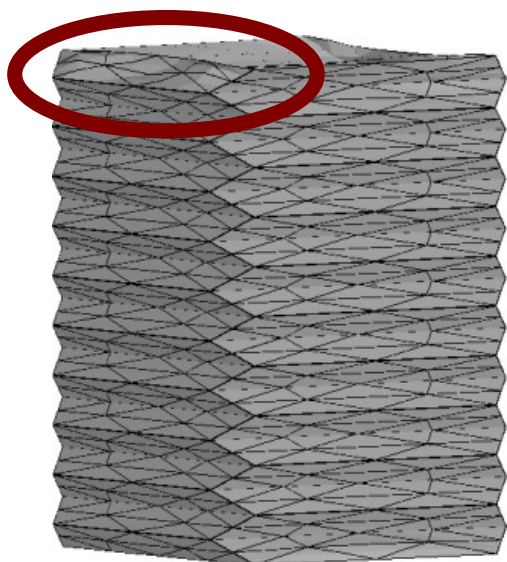
引張で初期高さ高い時



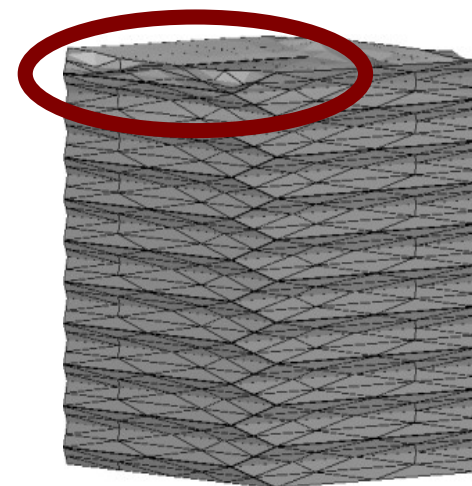
固定側の谷折り部 変形



固、山

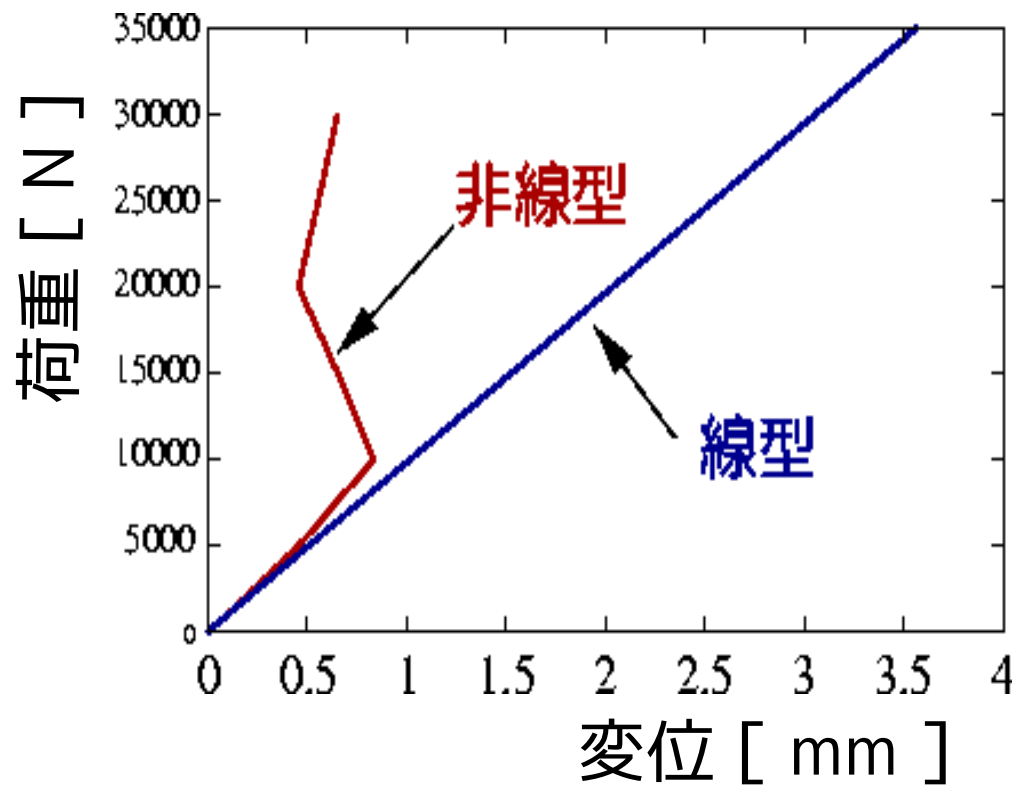


載、山



載、山

初期高さあり



初期高さなし

