

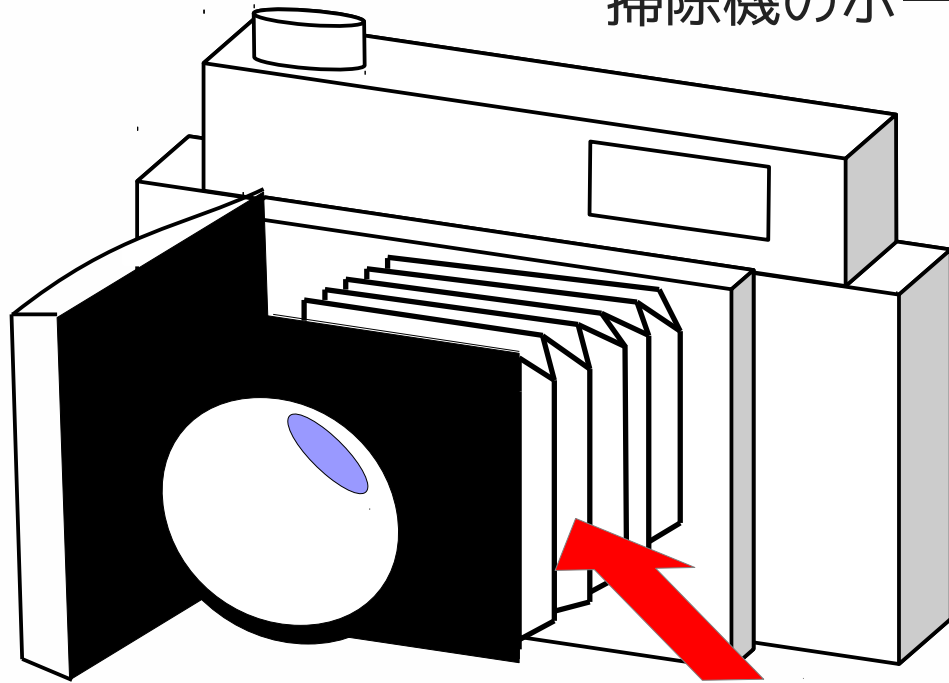
# 蛇腹折り構造を用いた支承の挙動

環境構造工学講座

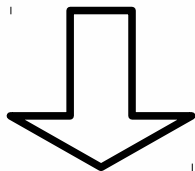
学籍番号：9010182

柴田勝也

カメラの蛇腹レンズ  
掃除機のホースなど

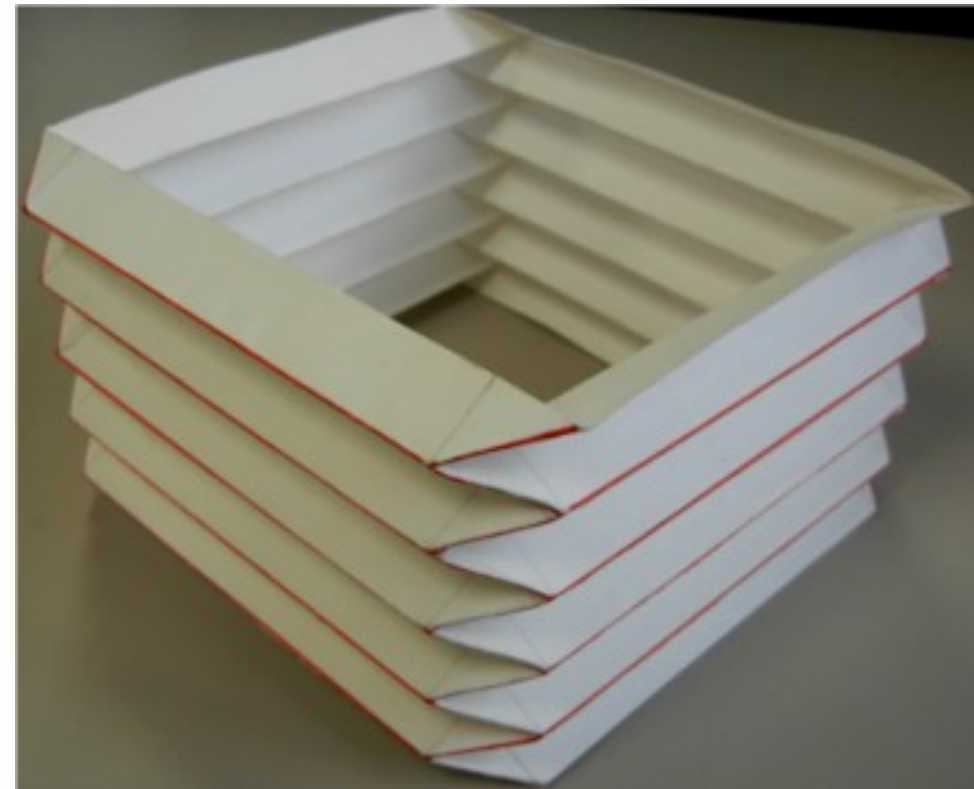


折り紙構造



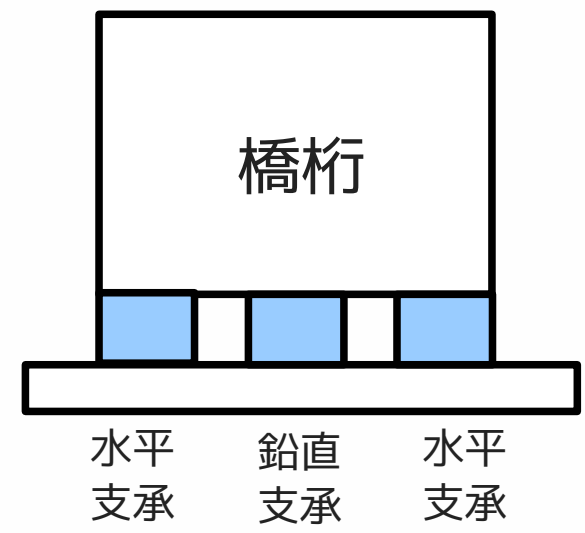
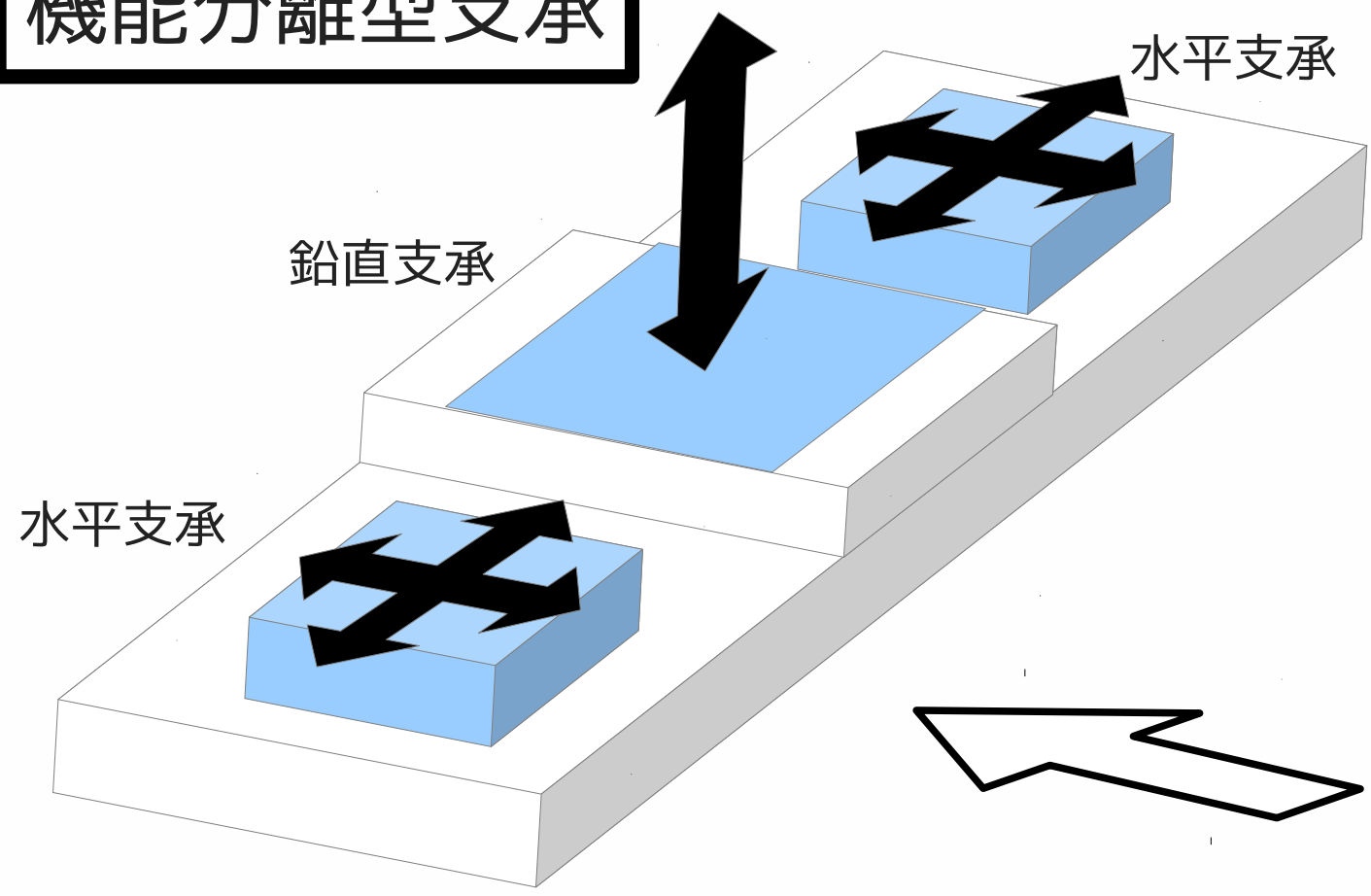
～特性～

折りたためる，高強度，バネ性能



1 2 3 4 5 6 7 8 9 10 11 12 13

# 機能分離型支承

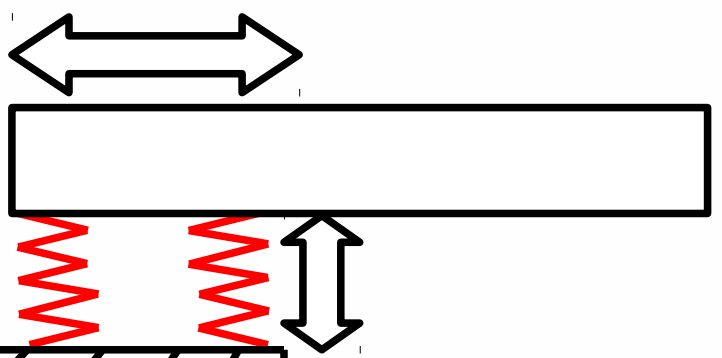


水平支承

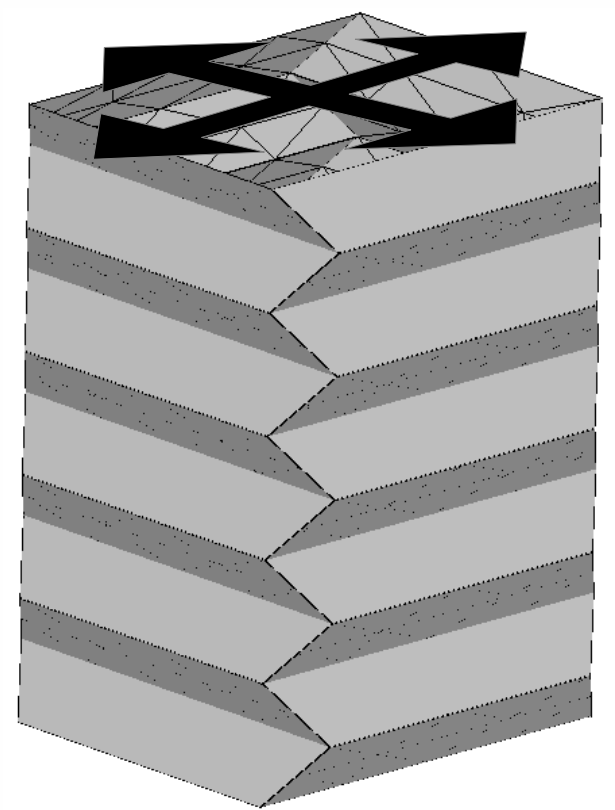
鉛直支承

水平支承

水平 鉛直 水平  
支承 支承 支承

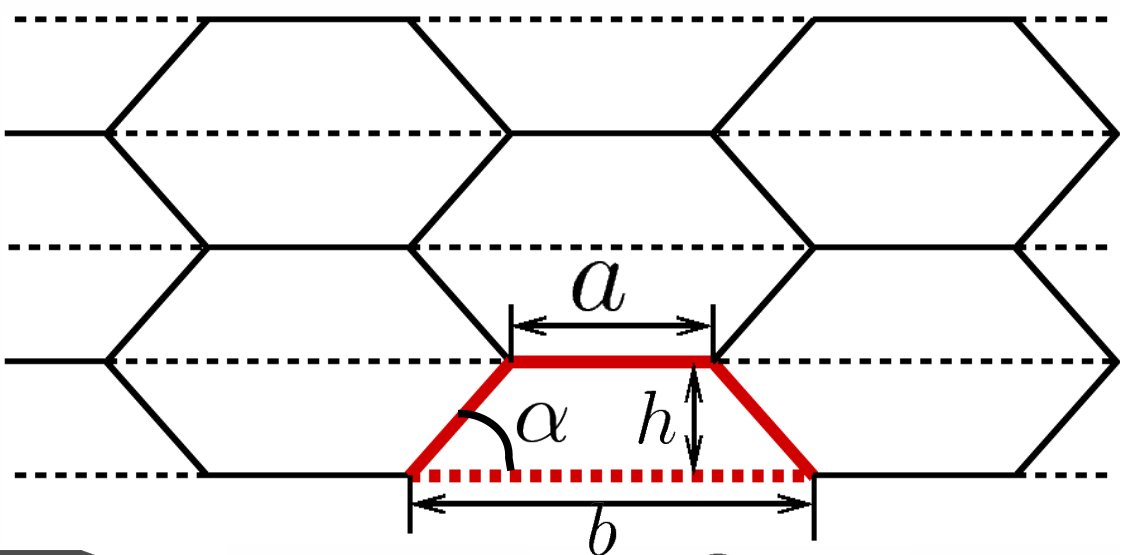


エネルギー吸収



1 2 3 4 5 6 7 8 9 10 11 12 13

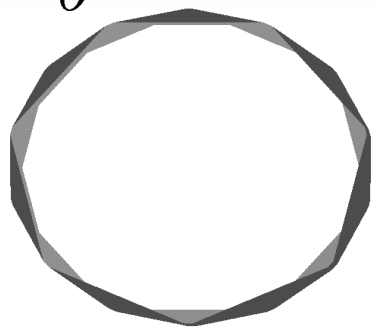
# パターン数



## 周方向パターン数



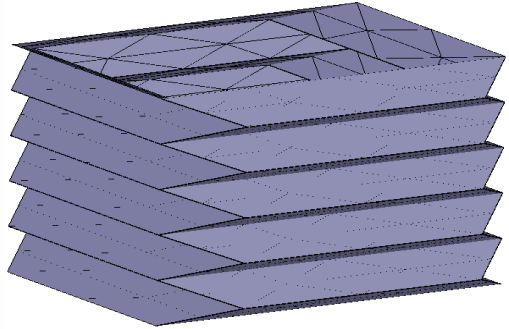
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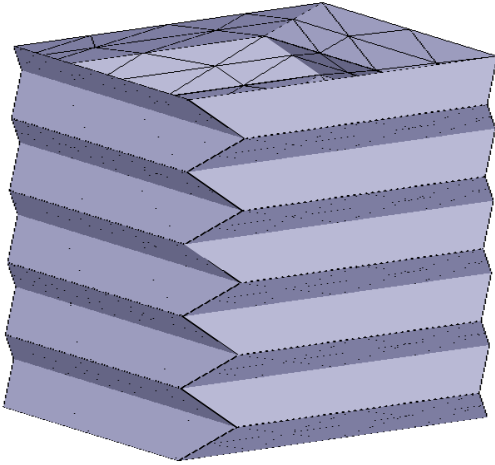
## 初期高さ



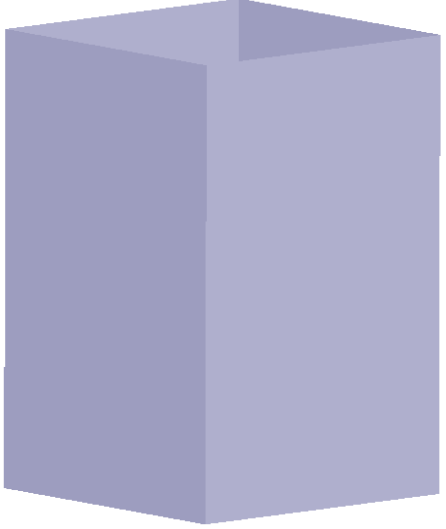
初期高さ0



初期高さ0.4



初期高さ0.8

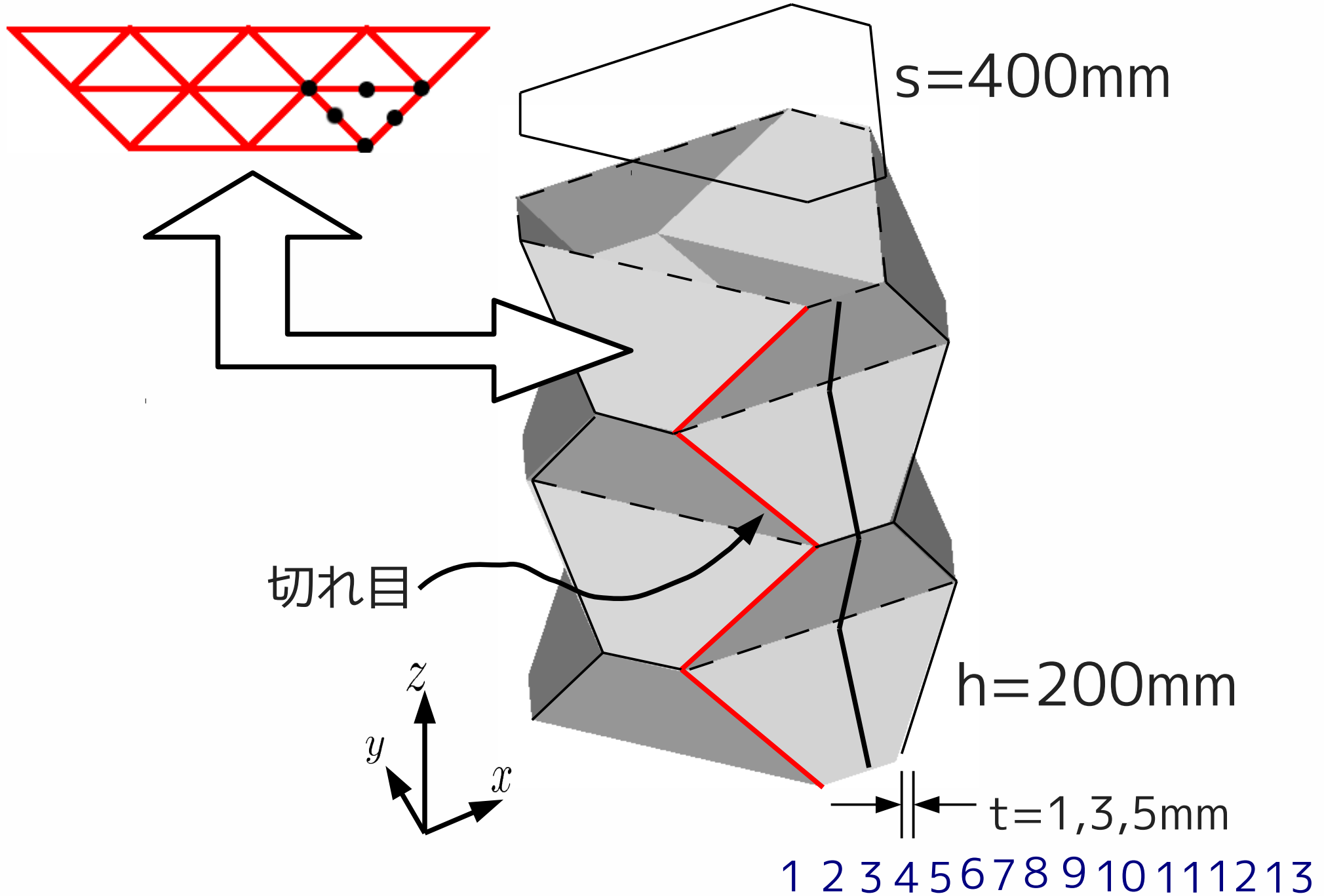


初期高さ1

1 2 3 4 5 6 7 8 9 10 11 12 13

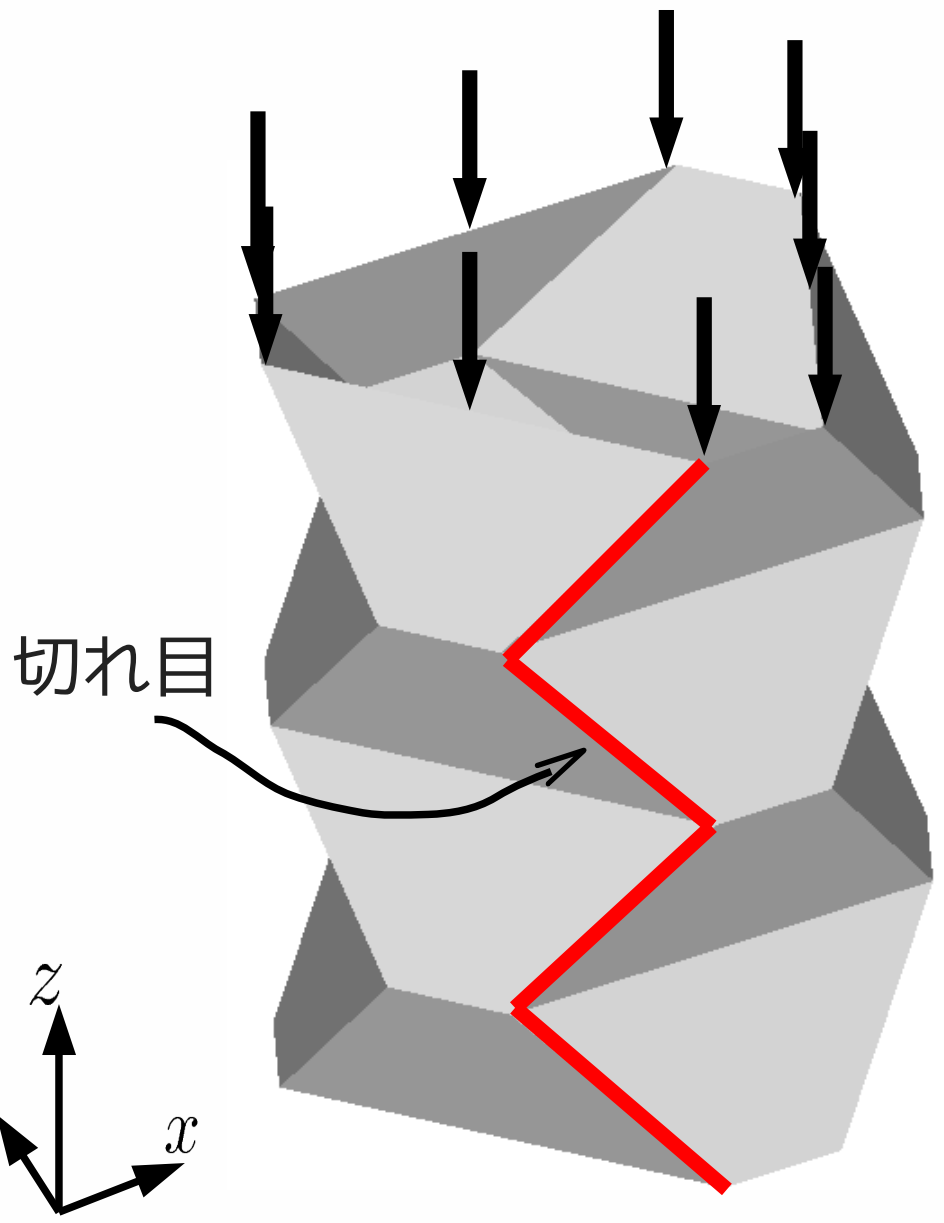
# 解析モデル

FEM解析 ・ ・ Calculix

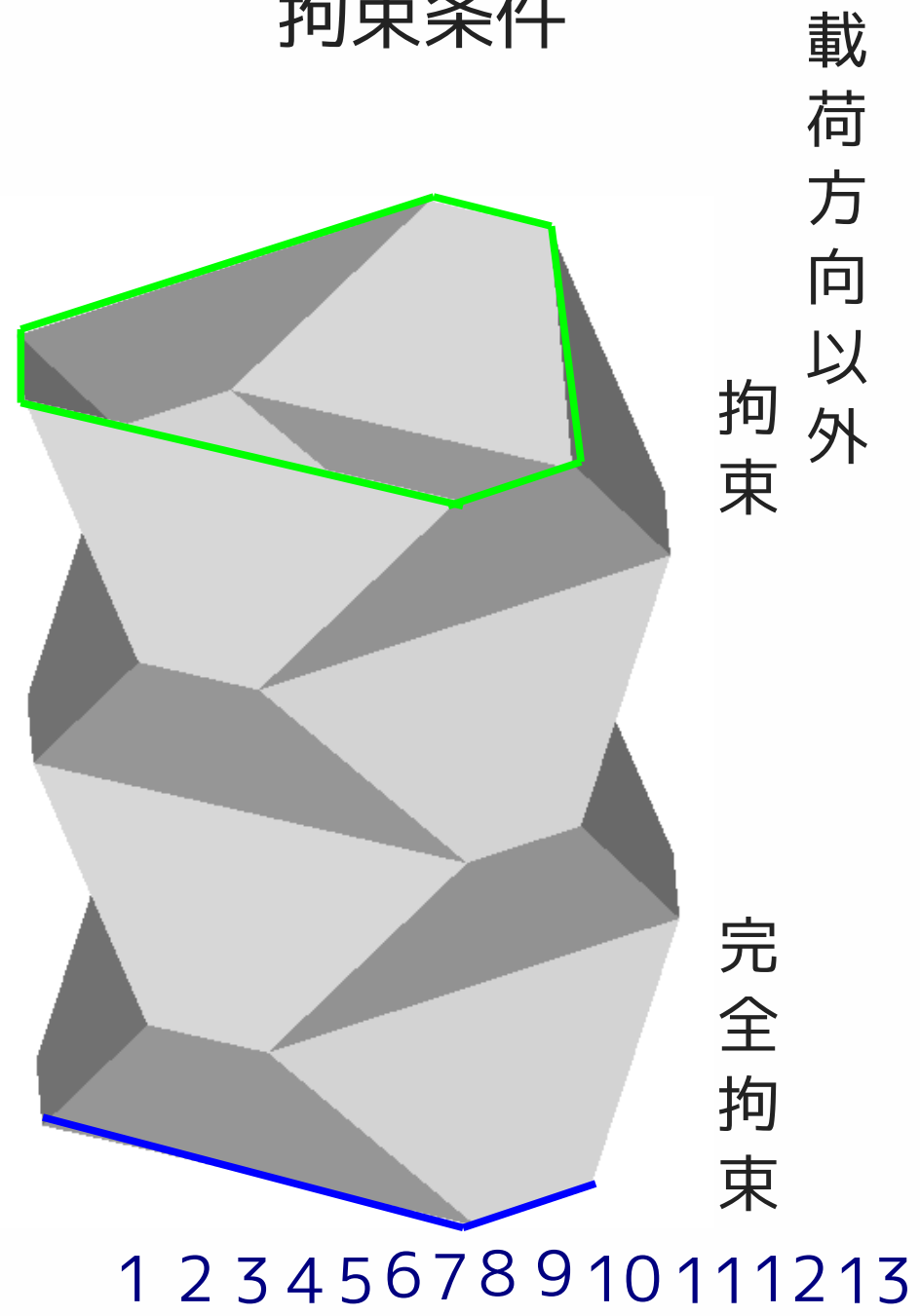


# 載荷・拘束条件

## 載荷条件

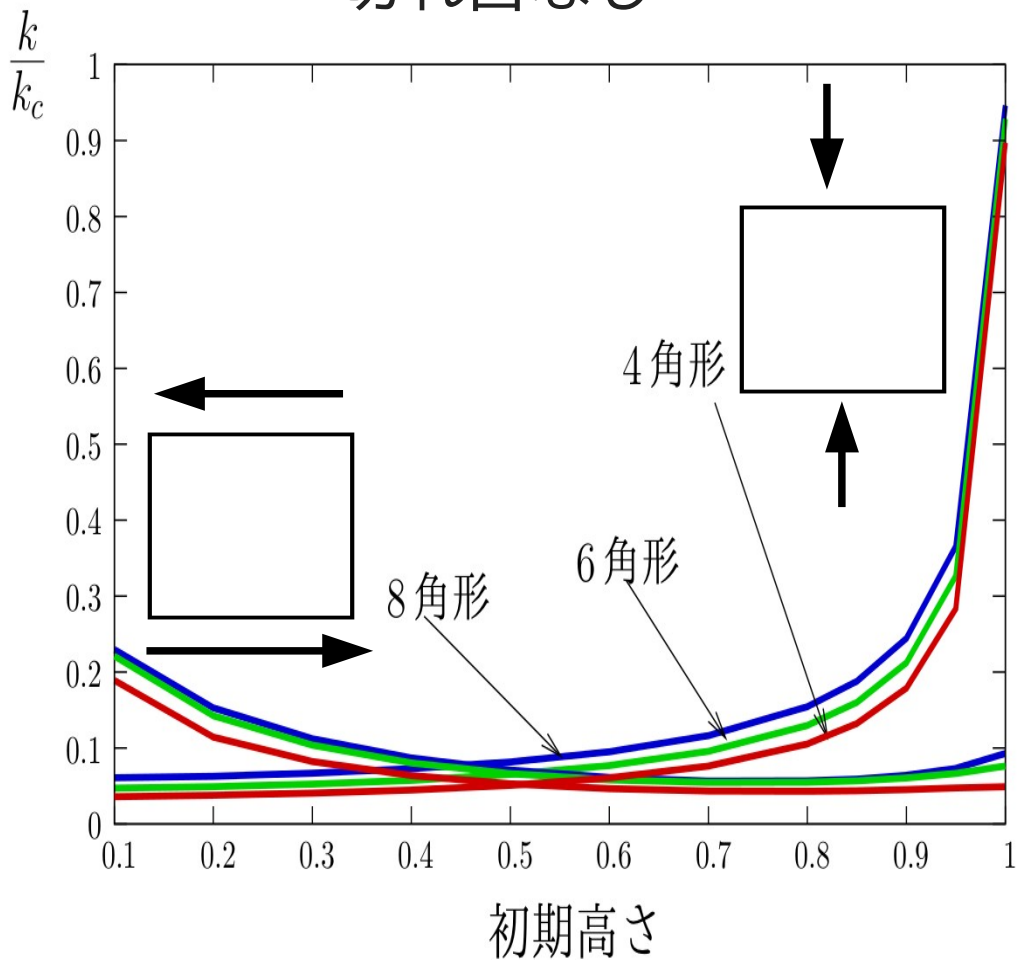


## 拘束条件

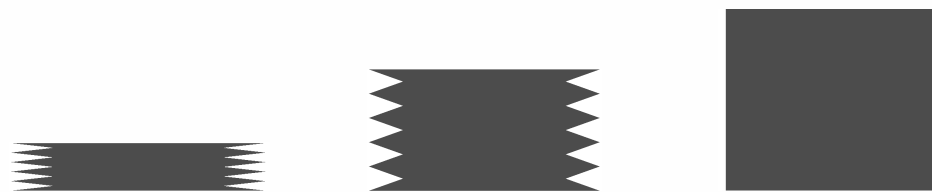
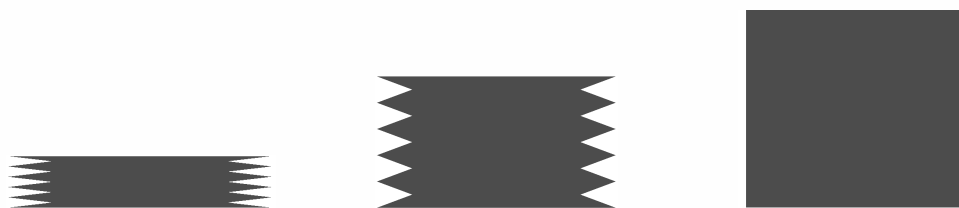
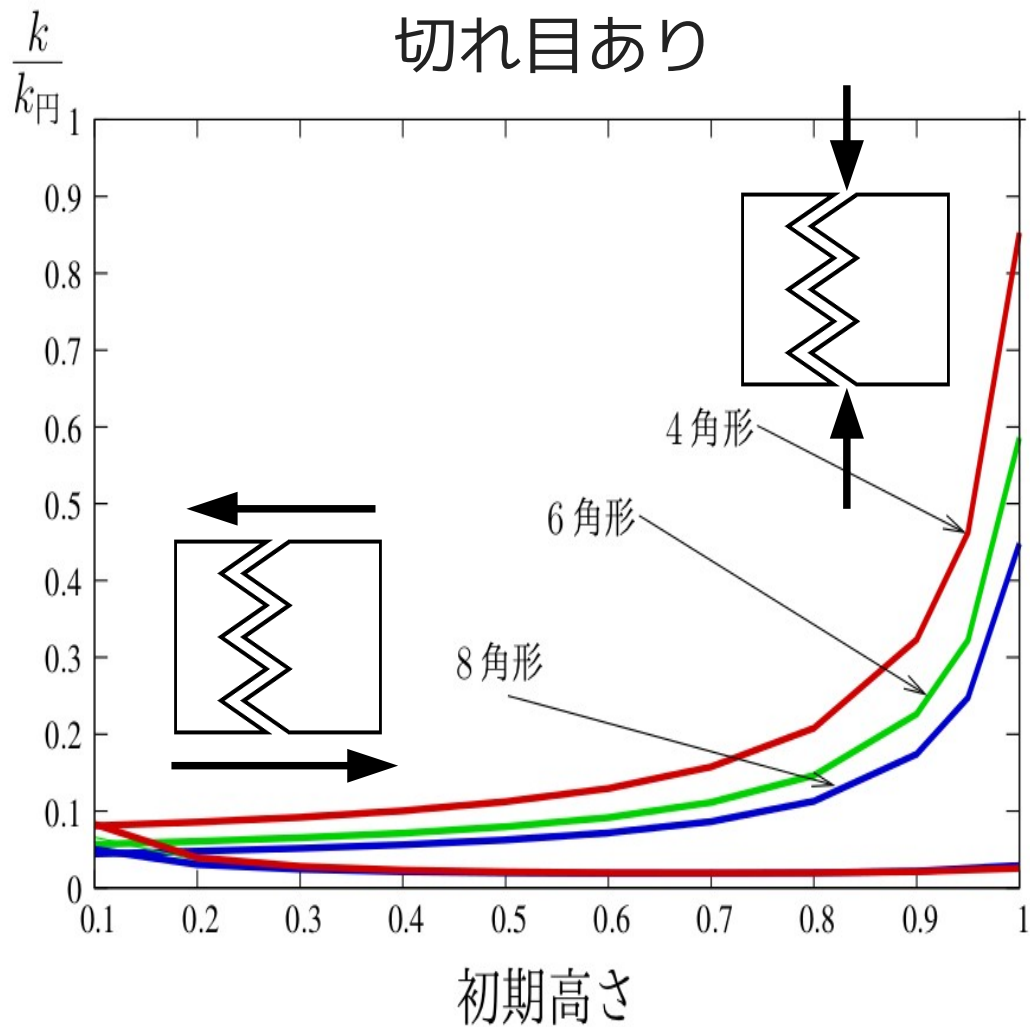


# バネ定数

切れ目なし



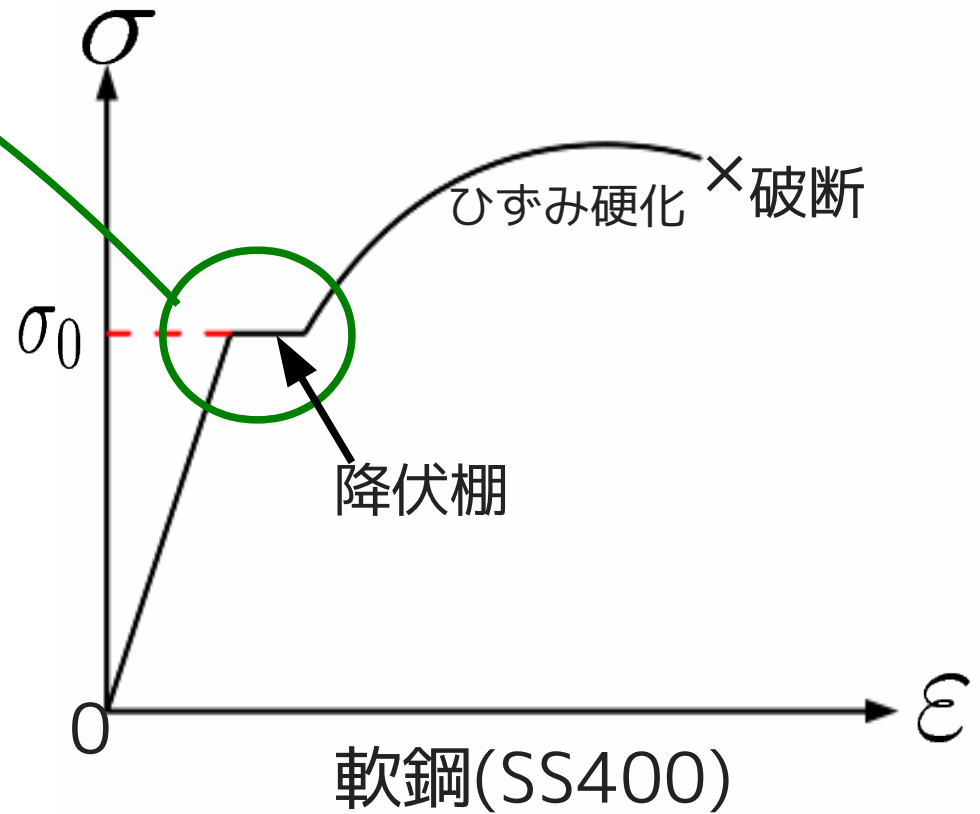
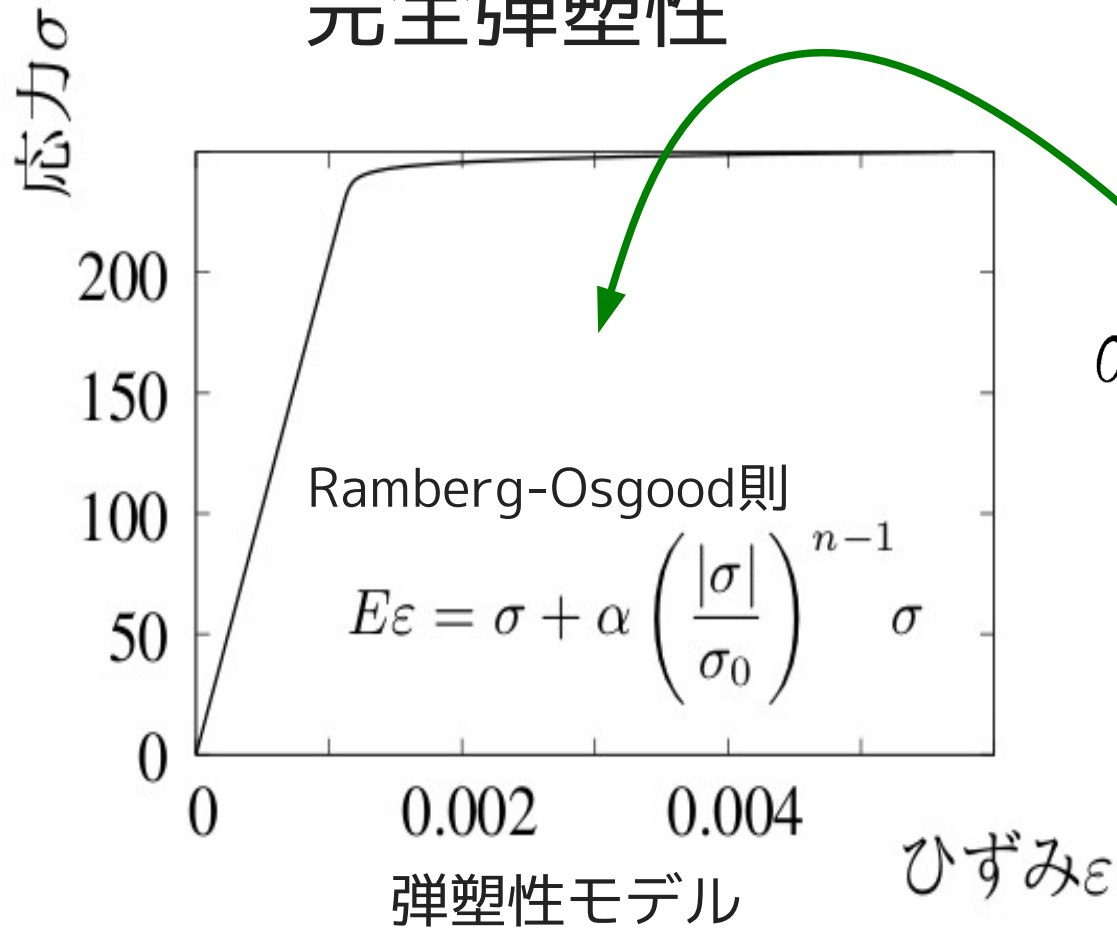
切れ目あり



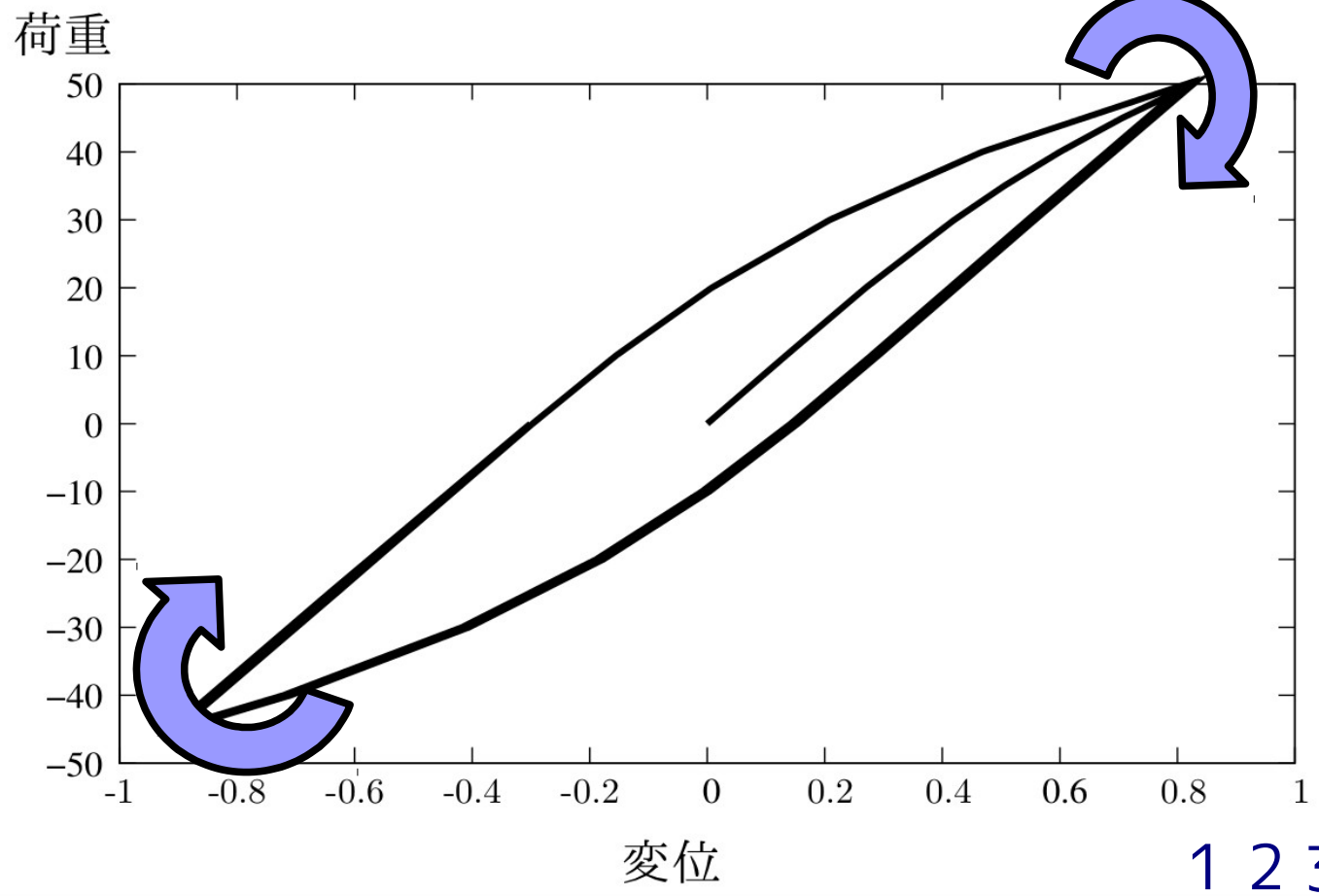
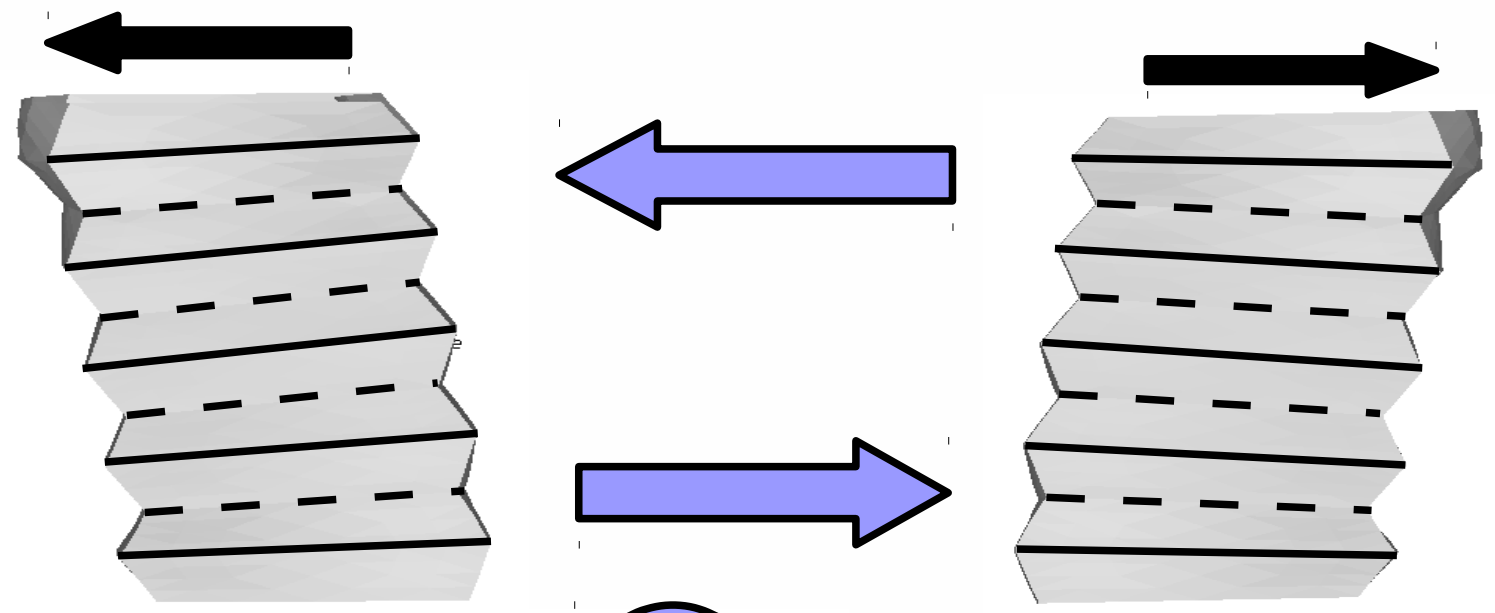
1 2 3 4 5 6 7 8 9 10 11 12 13

# 弾塑性モデル

完全弾塑性



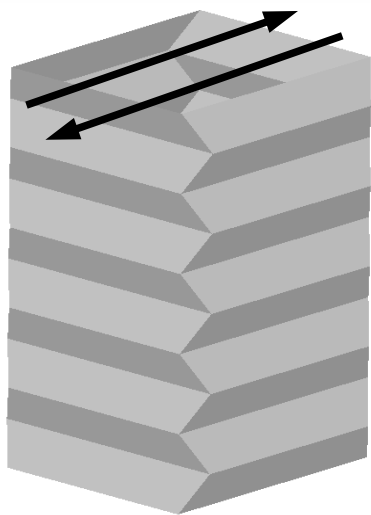
# 交番载荷



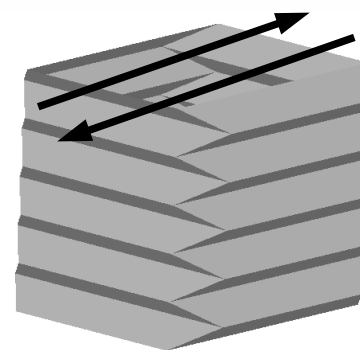
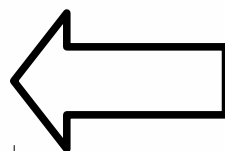
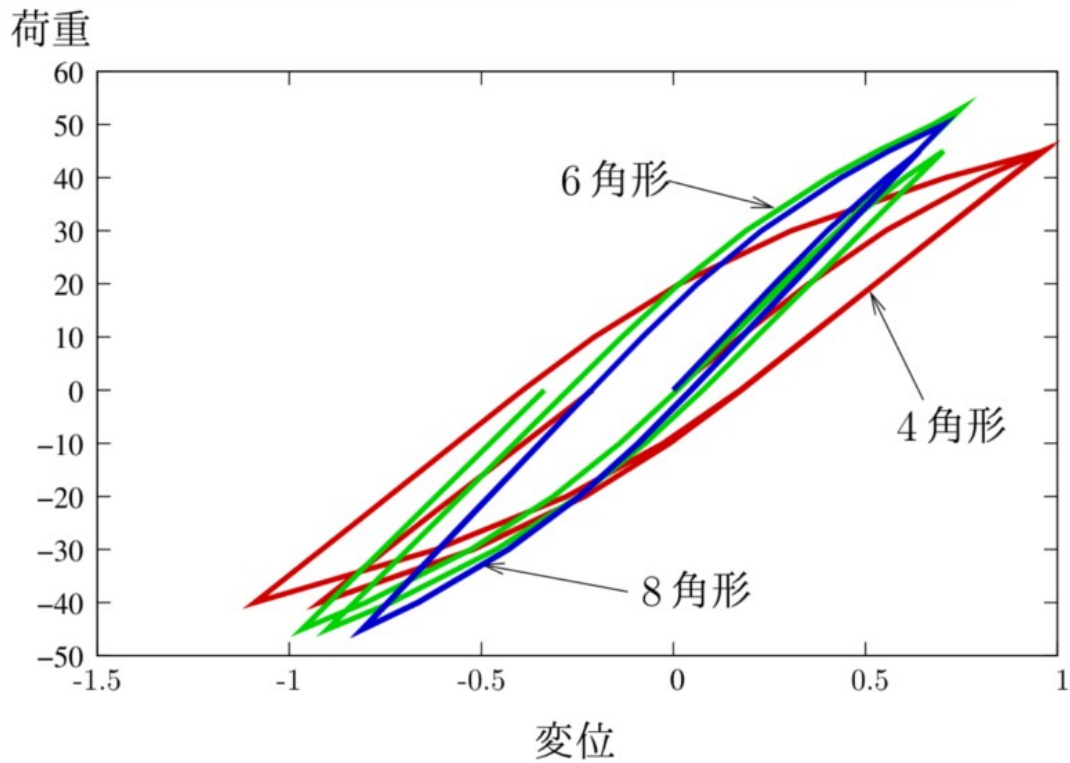
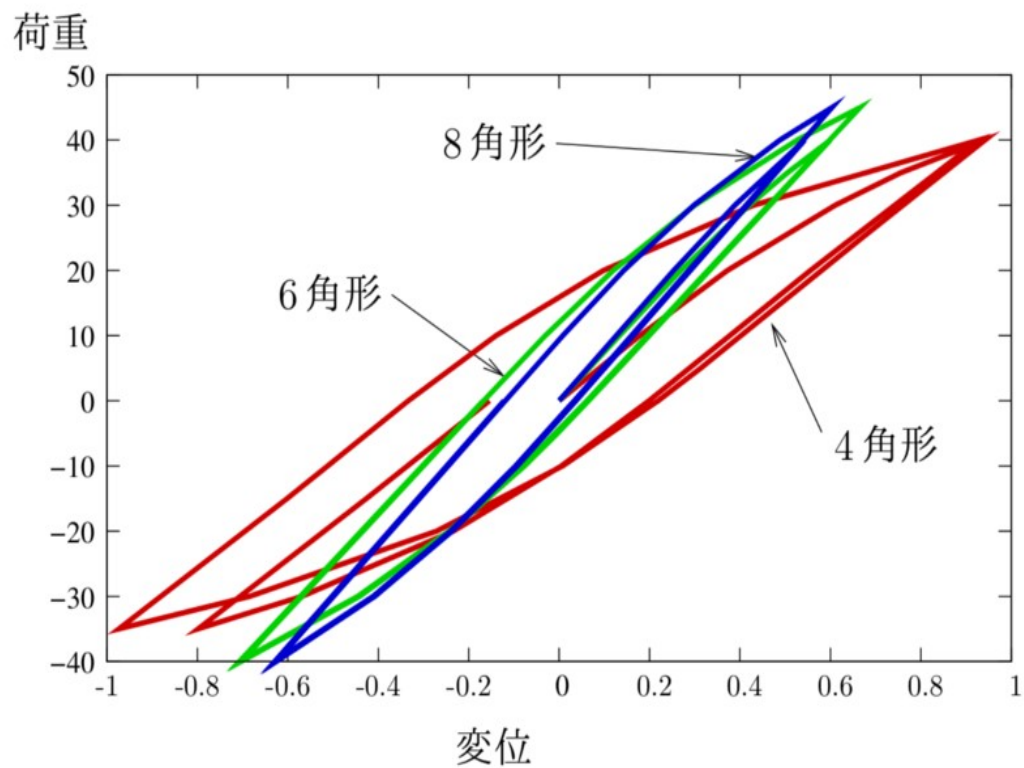
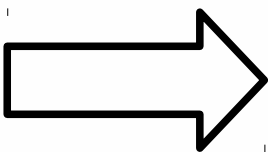
1 2 3 4 5 6 7 8 9 10 11 12 13



# 角数・初期高さ変化

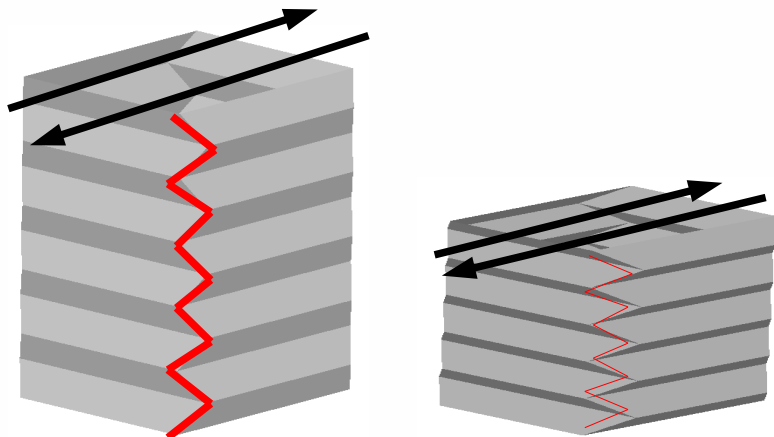


初期高さ0.9



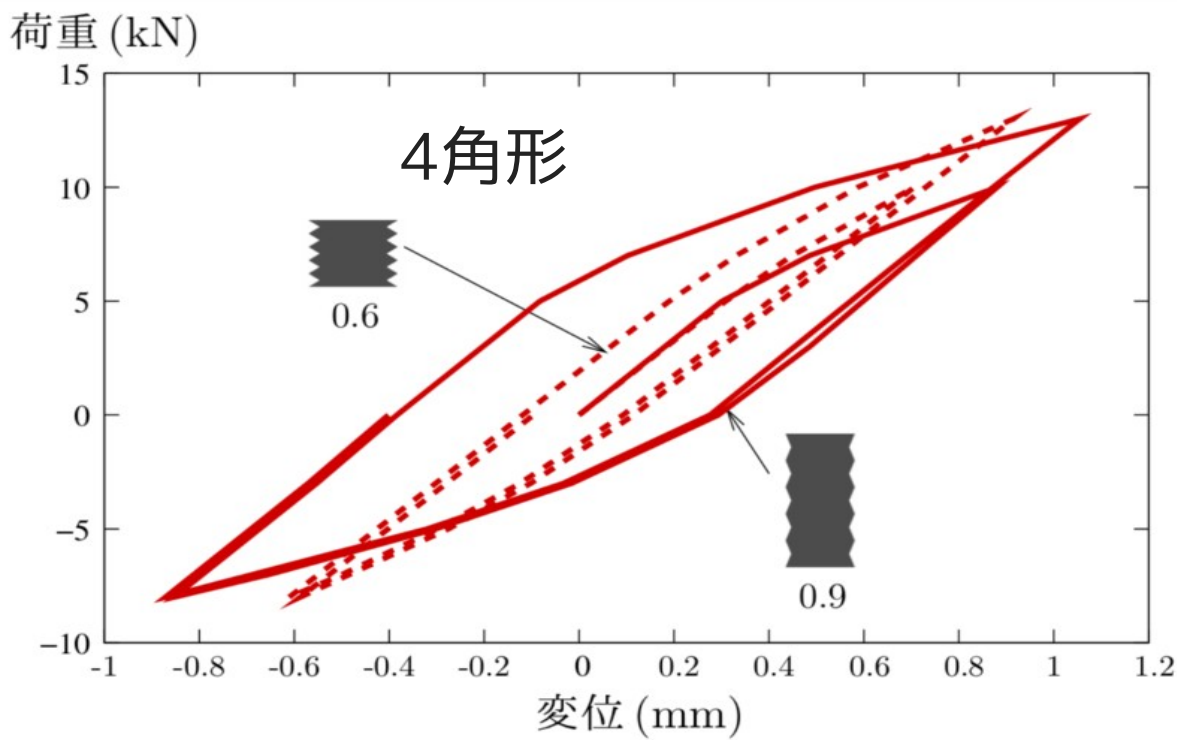
初期高さ0.6

# 初期高さ変化 (切れ目あり)



初期高さ0.9

初期高さ0.6

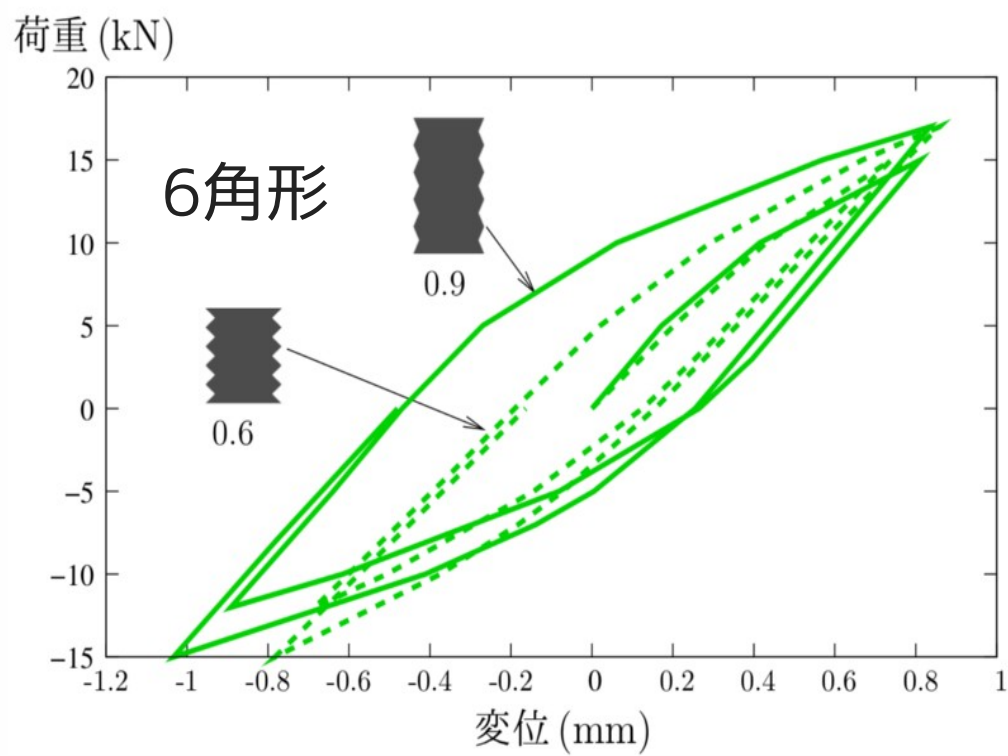


4角形

0.6

0.9

変位 (mm)

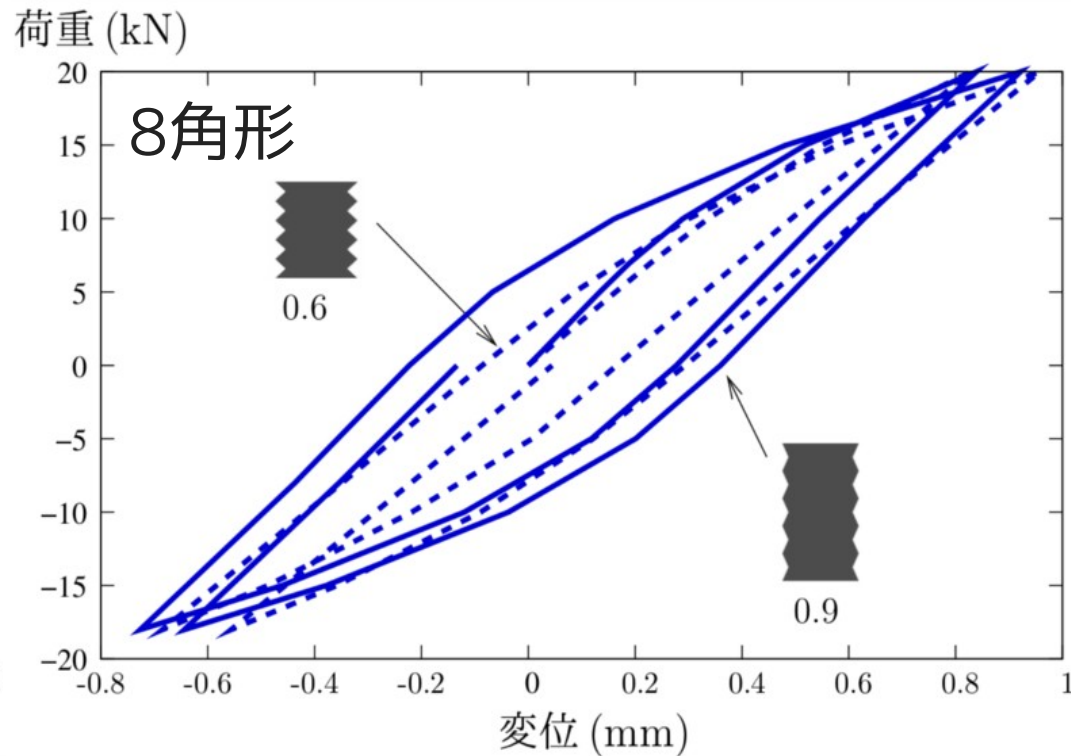


6角形

0.6

0.9

変位 (mm)



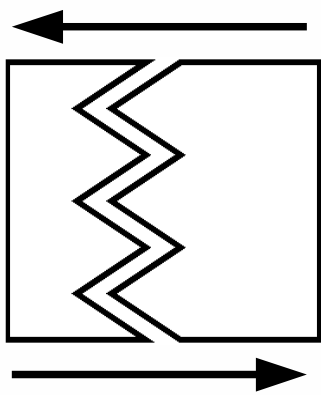
8角形

0.6

0.9

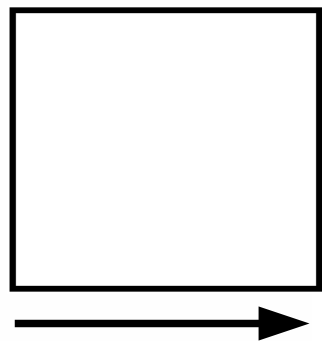
変位 (mm)

切れ目あり・なし

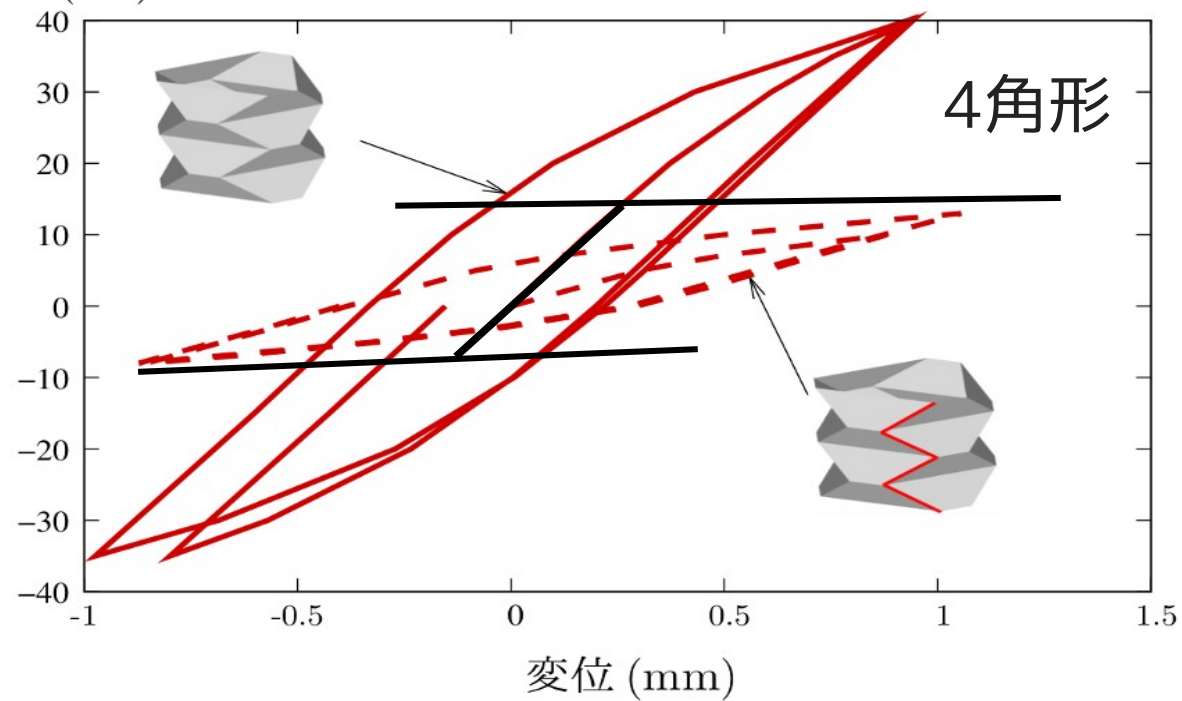


切れ目あり

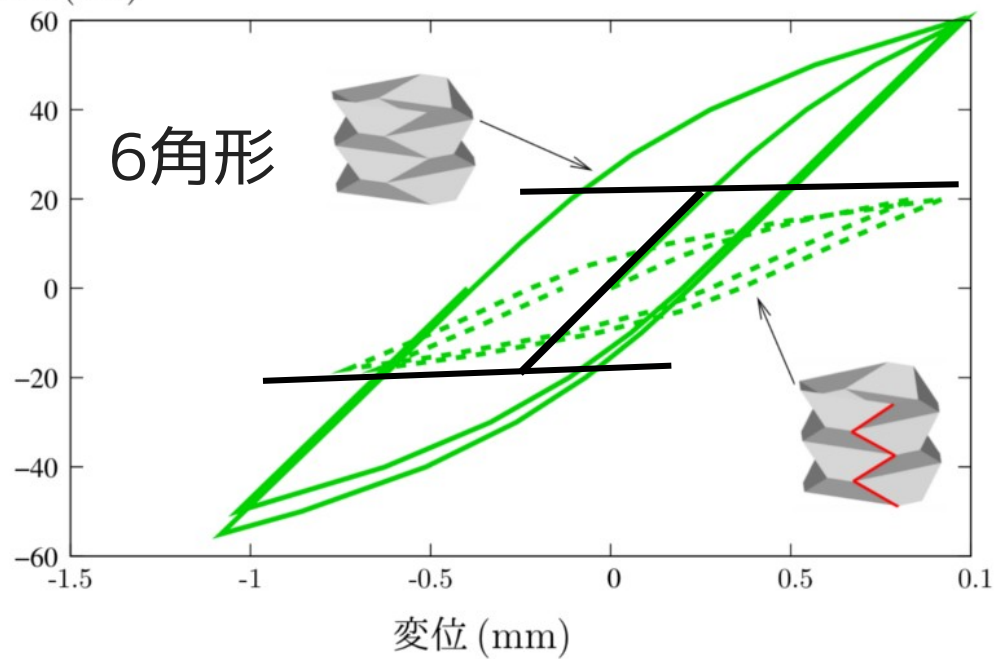
切れ目なし



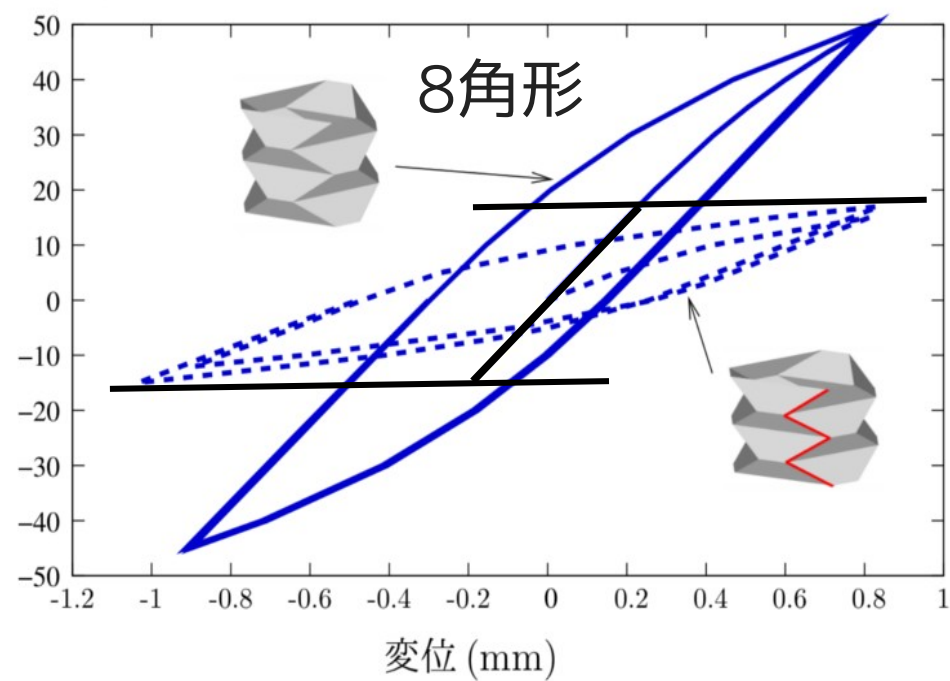
荷重 (kN)



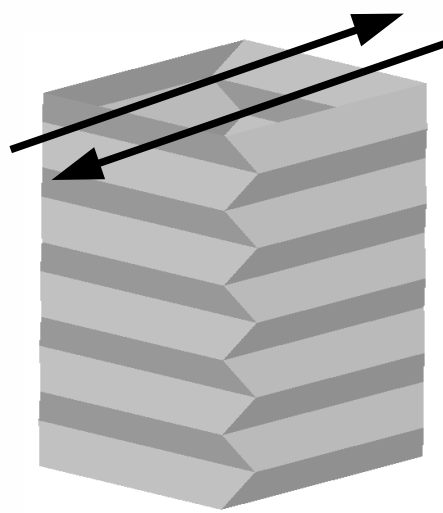
荷重 (kN)



荷重 (kN)

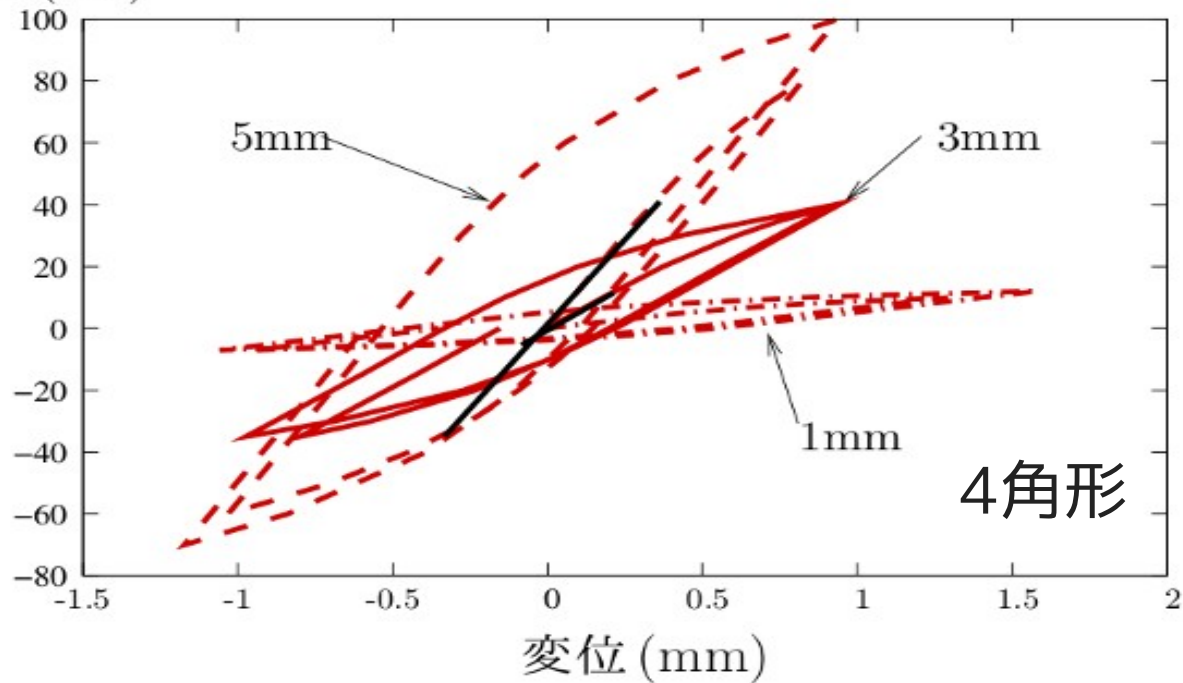


# 厚さ変化

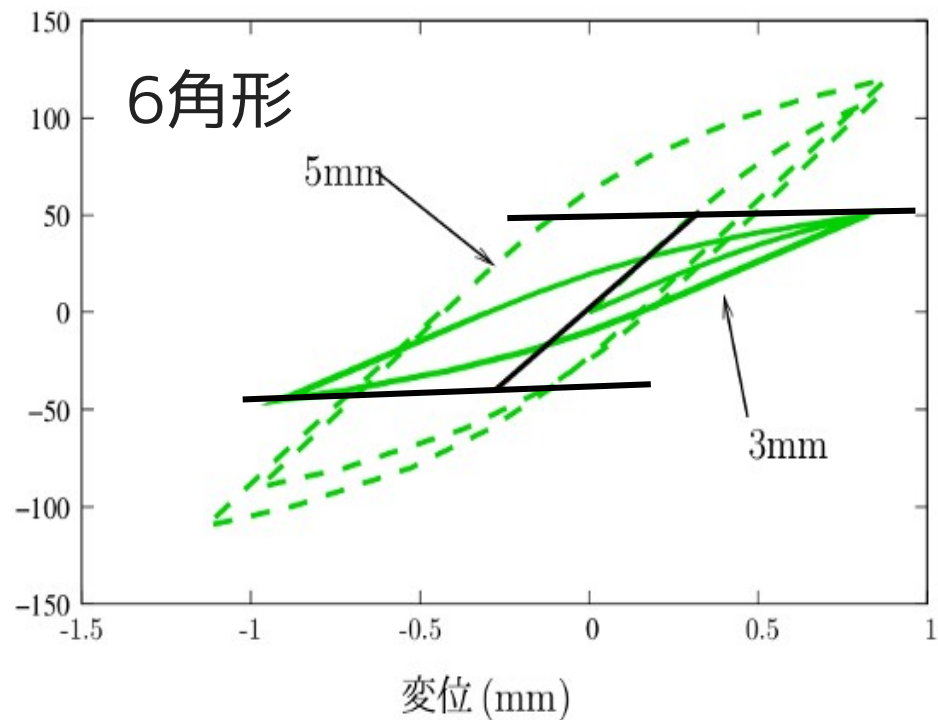


初期高さ0.9

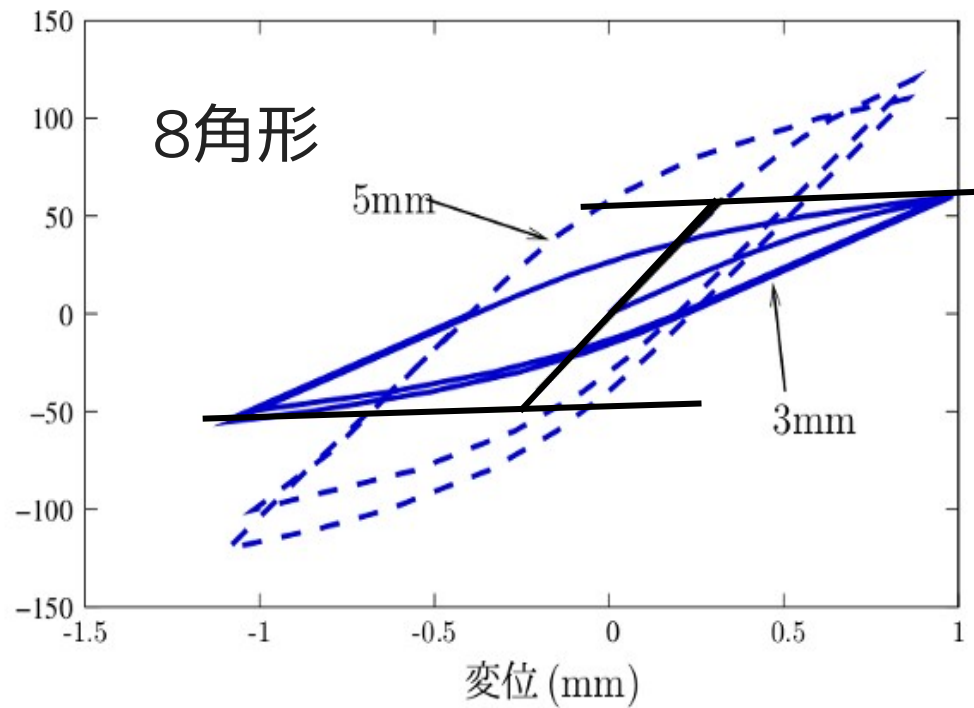
荷重 (kN)



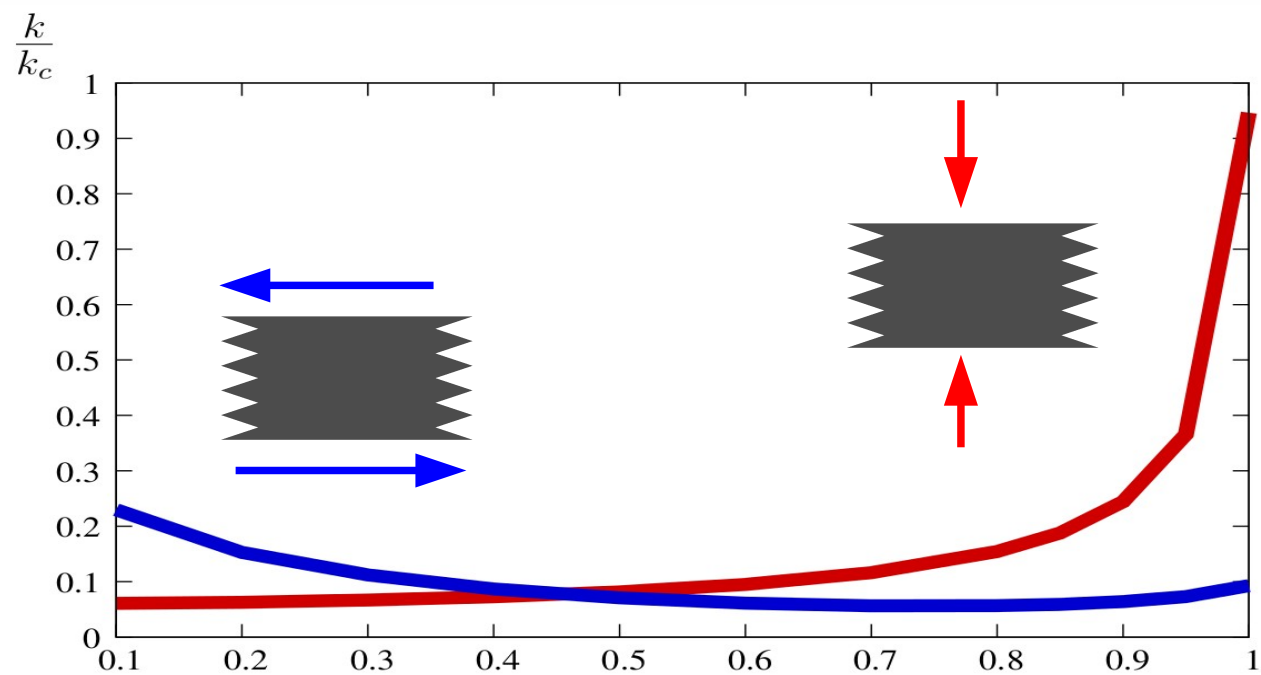
荷重 (kN)



荷重 (kN)



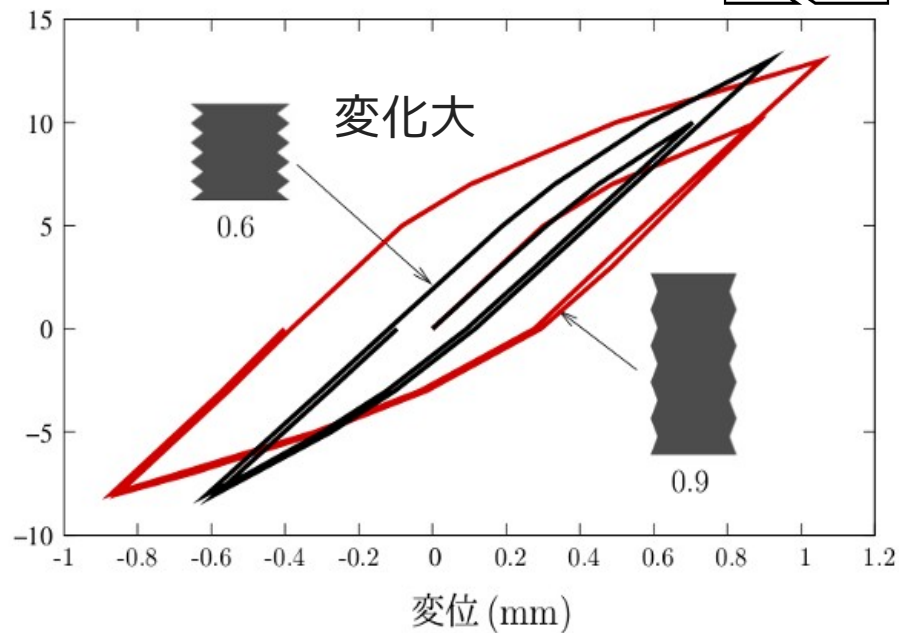
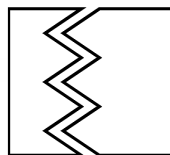
# まとめ



# 交番载荷

荷重 (kN)

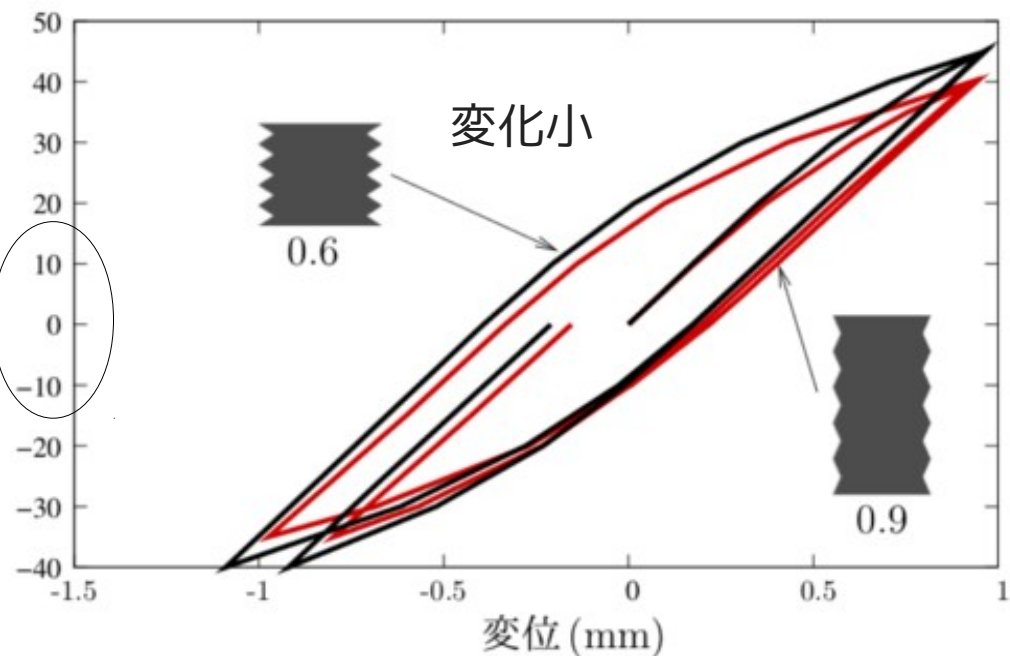
切れ目あり



初期高さ

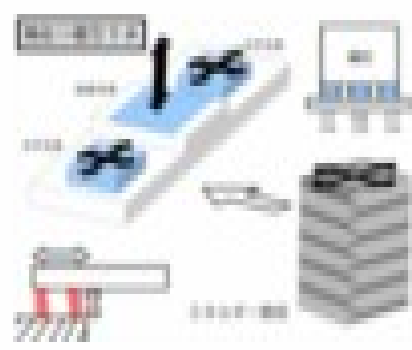
荷重 (kN)

切れ目なし

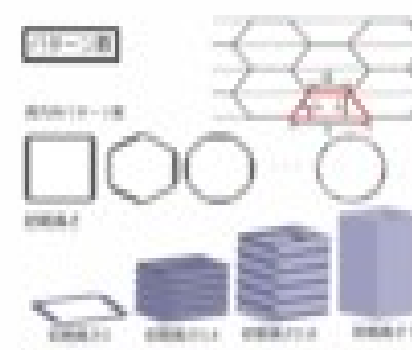




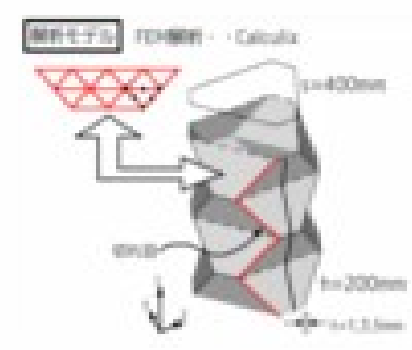
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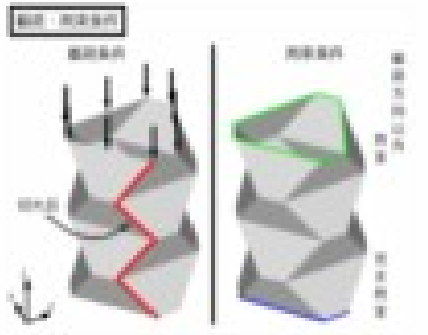
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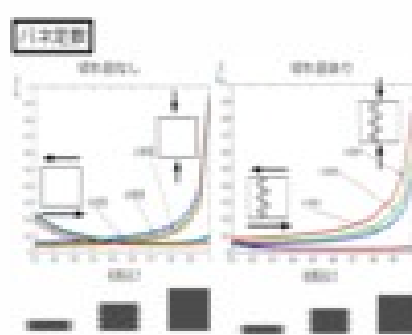
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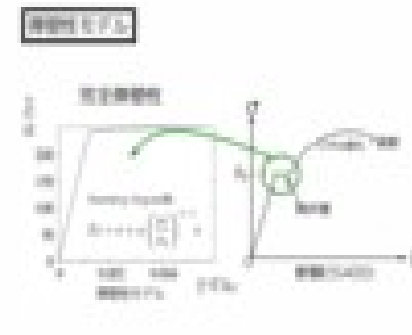
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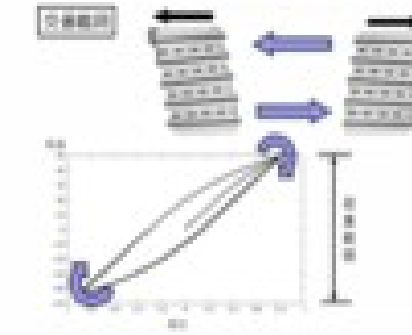
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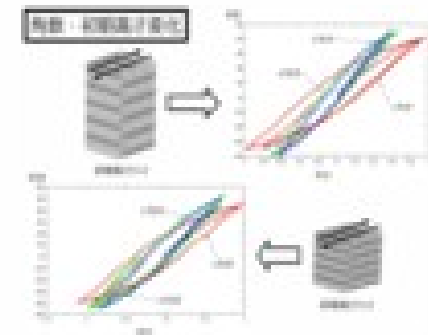
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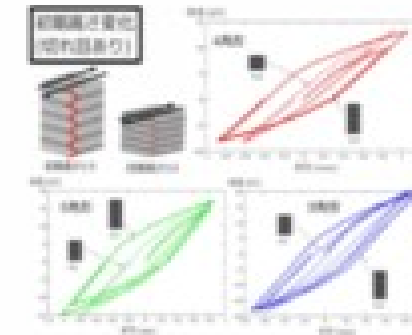
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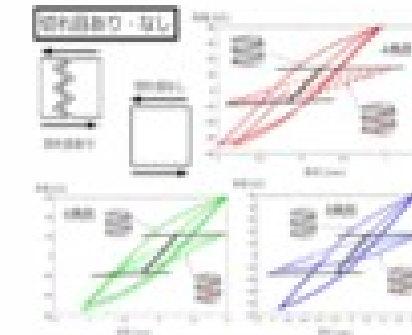
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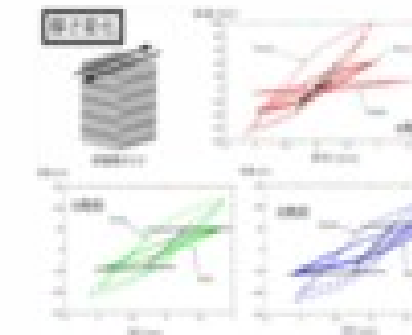
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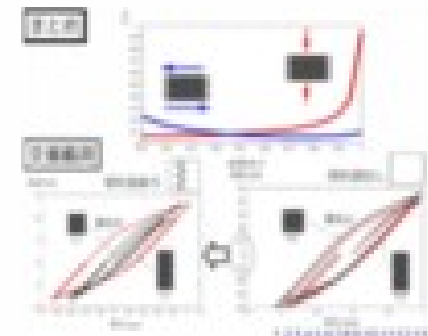
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11



12

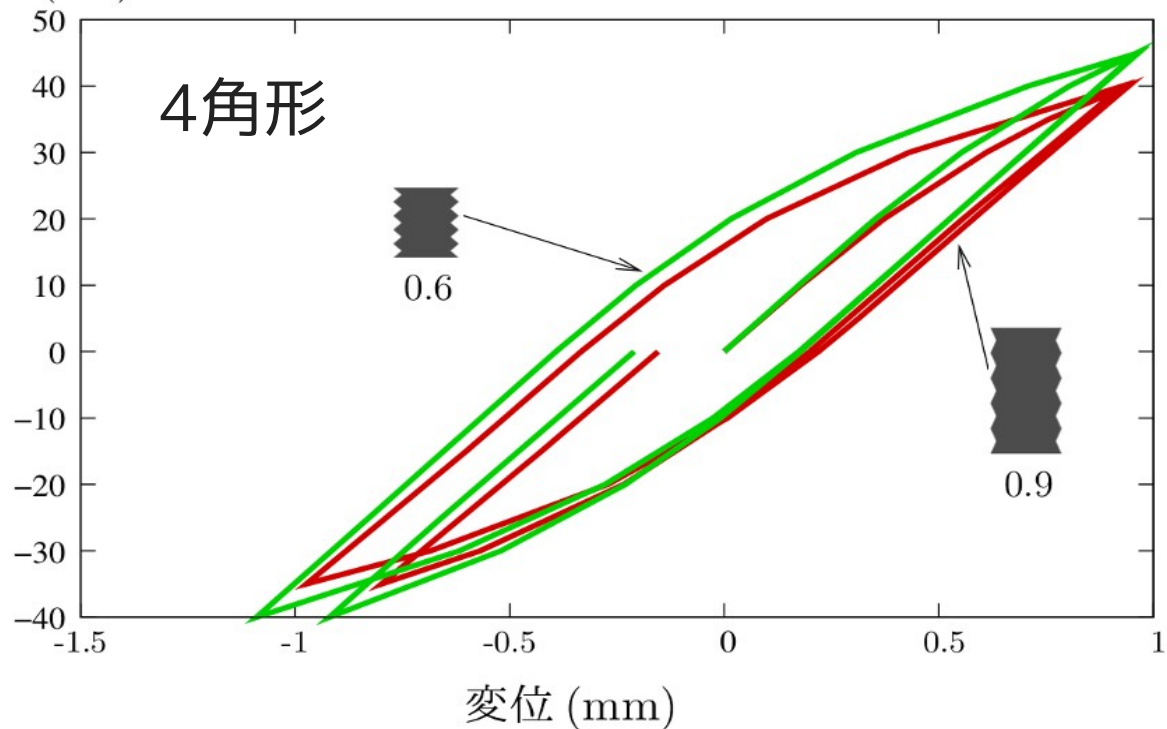


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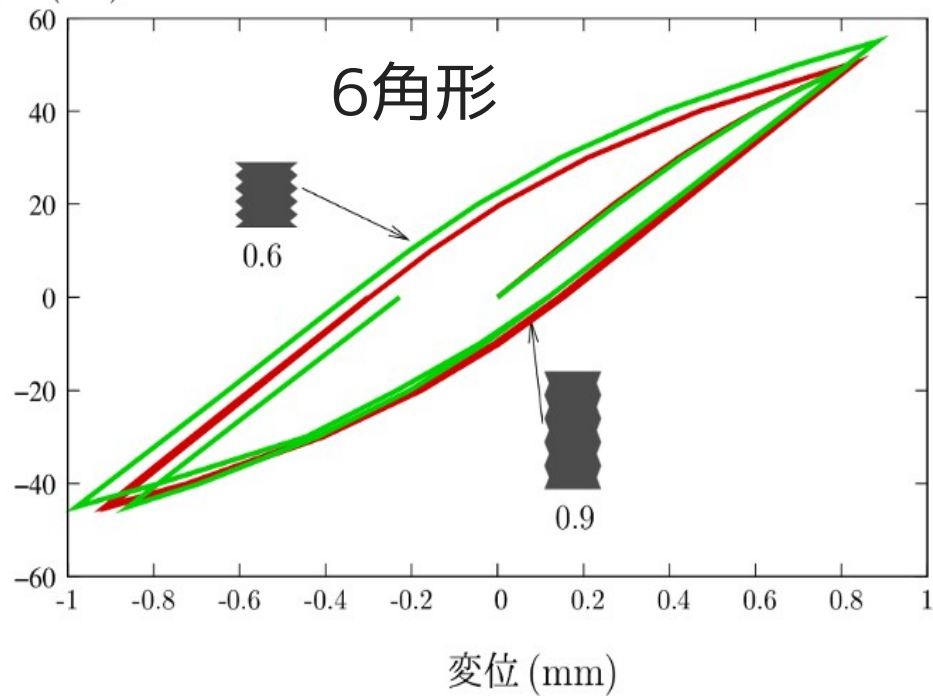
# 目次

# 初期高さ変化

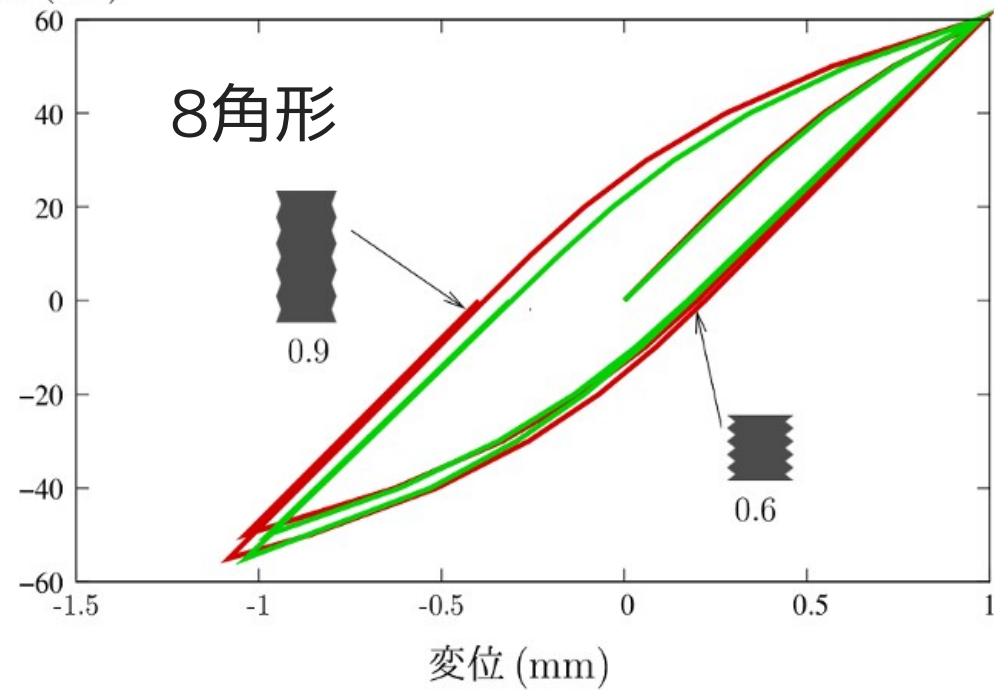
荷重 (kN)



荷重 (kN)



荷重 (kN)



# 厚さ変化(切れ目あり)

