

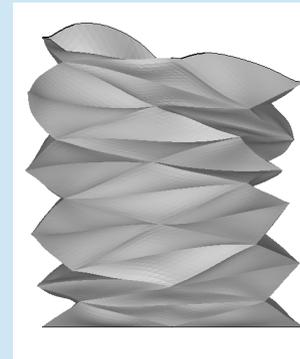
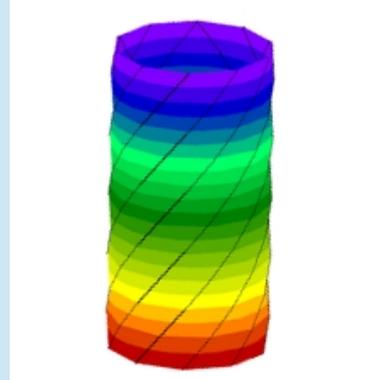
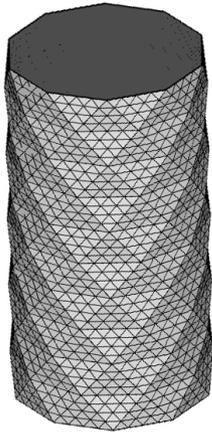
3Dプリンター造形材料の異方性について

7510724 佐藤佑

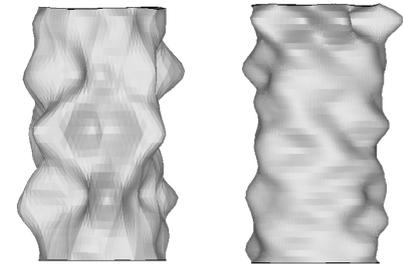
実際に作るには
難しい!

理論値がない!

有限要素法で解析



条件設定
によって変化



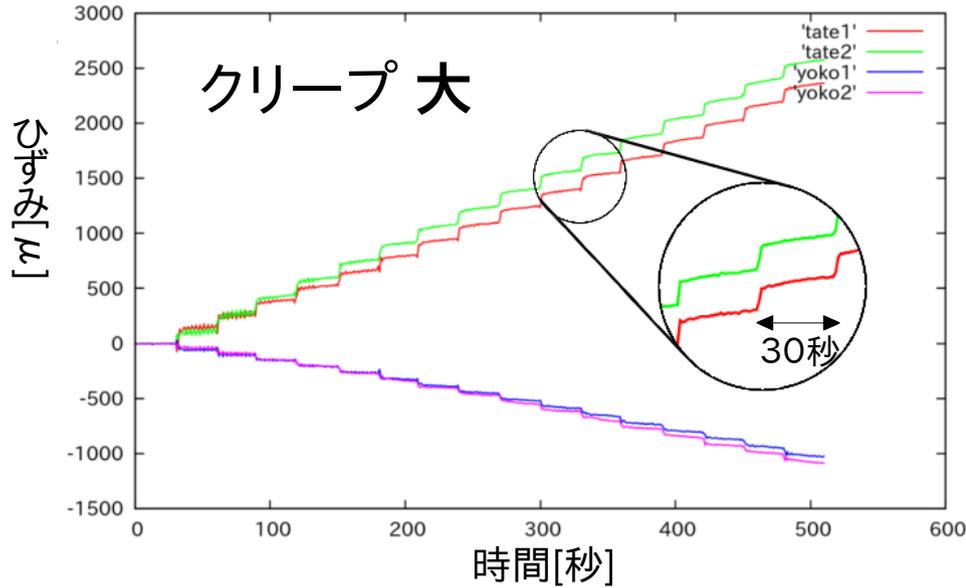
比較して、有限要素法
の精度を検証

3Dプリンターで印刷して試験

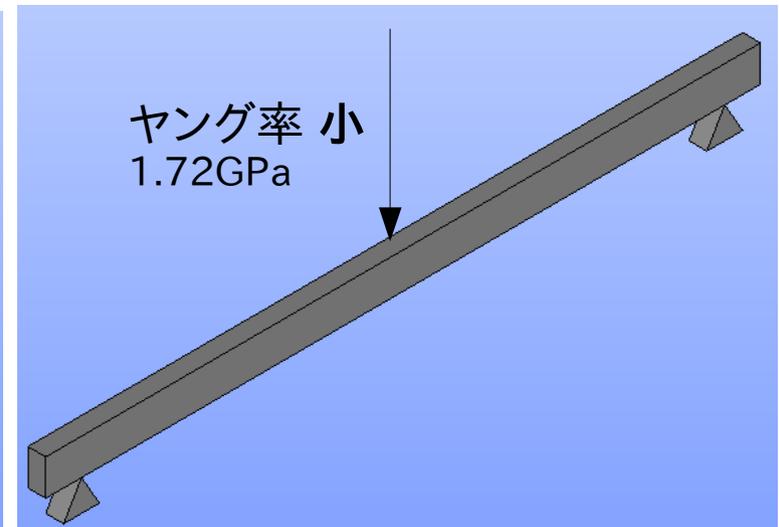
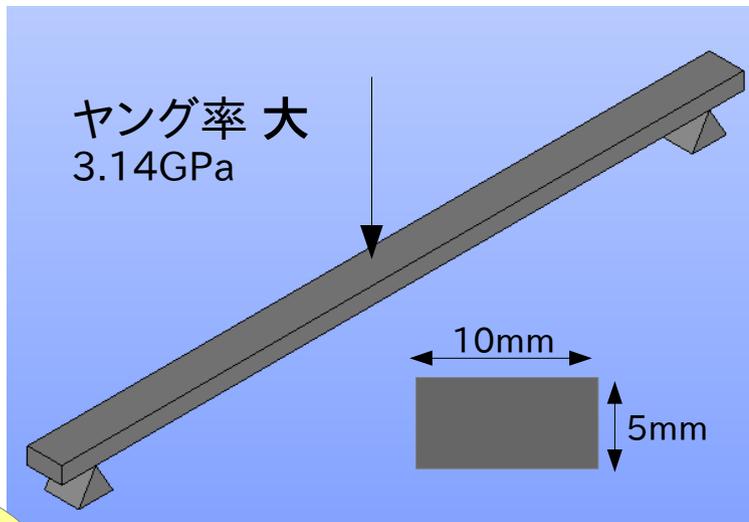
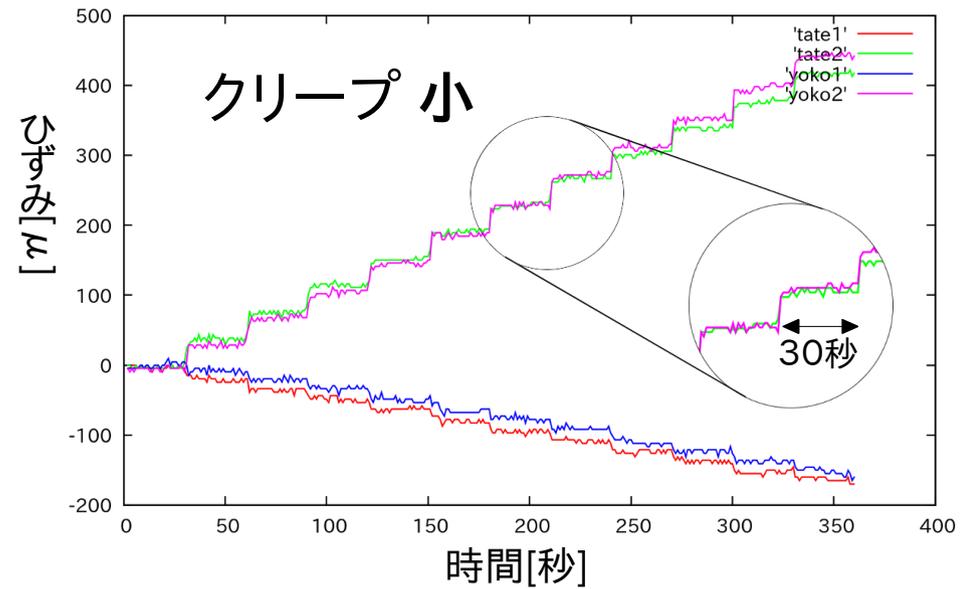


これまでの問題点

Fullcure720 (一般的な材料)



RGD525 (高耐熱性)

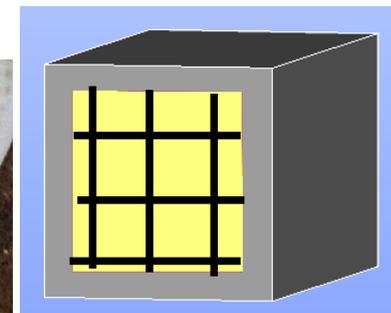
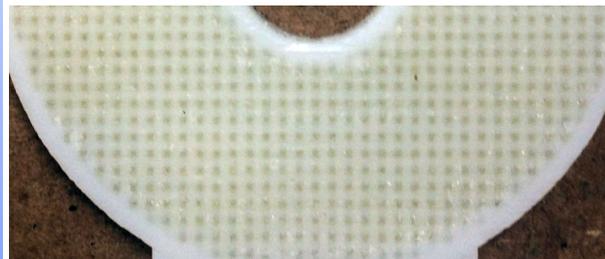
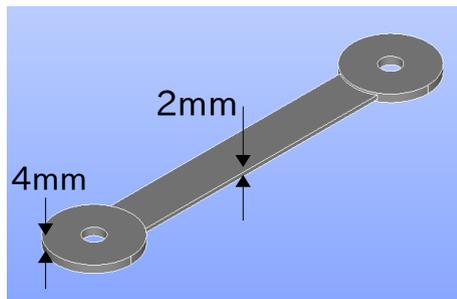


異方性

FEMと比較できるように異方性を検証

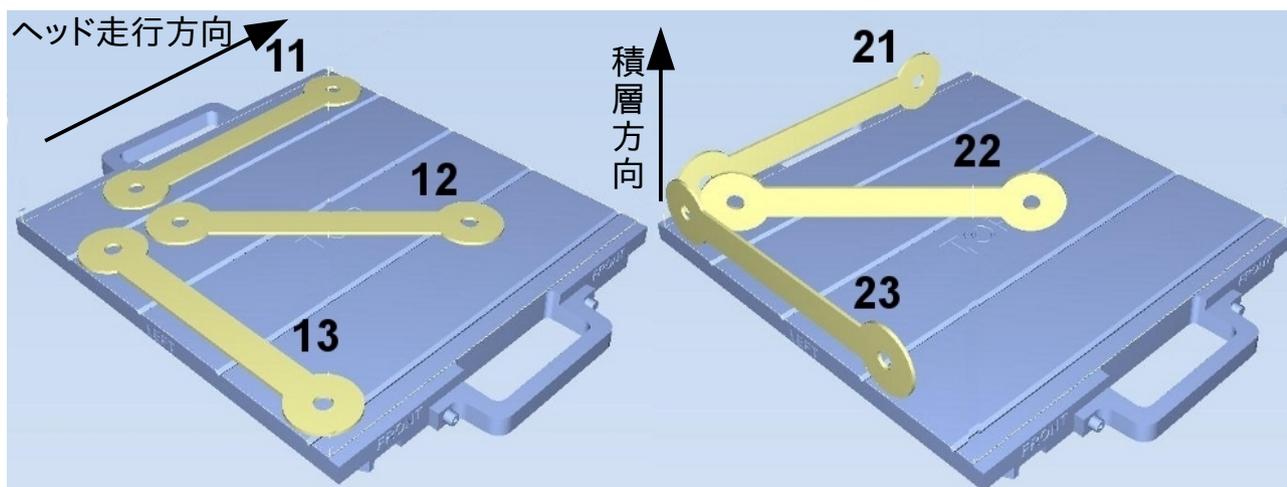
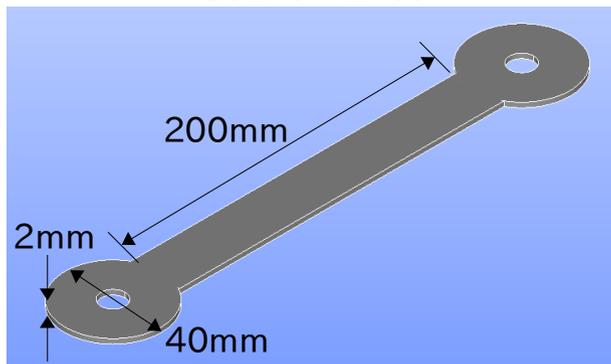
試験体について

モデル材はRGD525

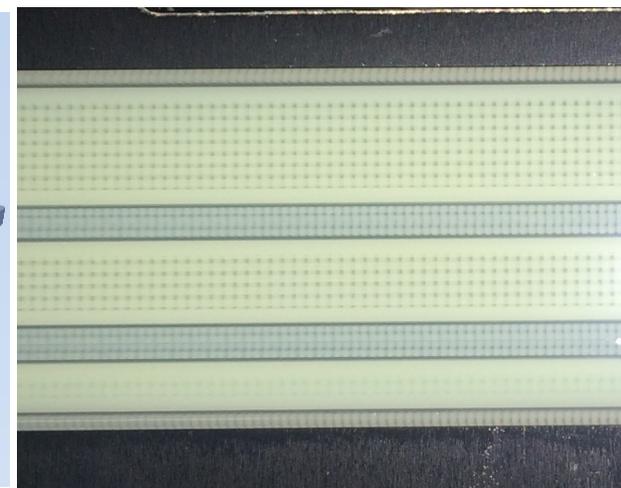
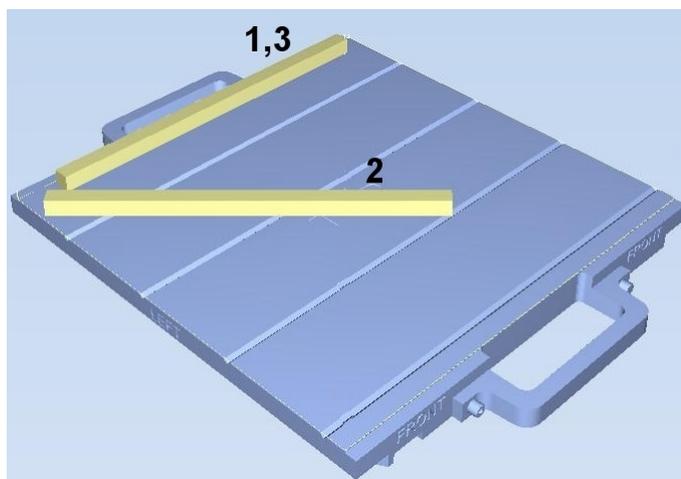
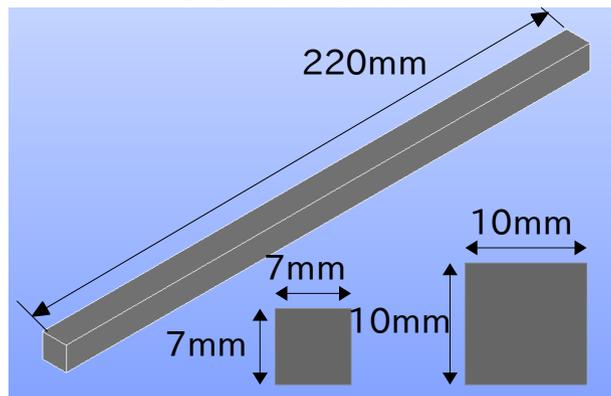


昨年の試験体

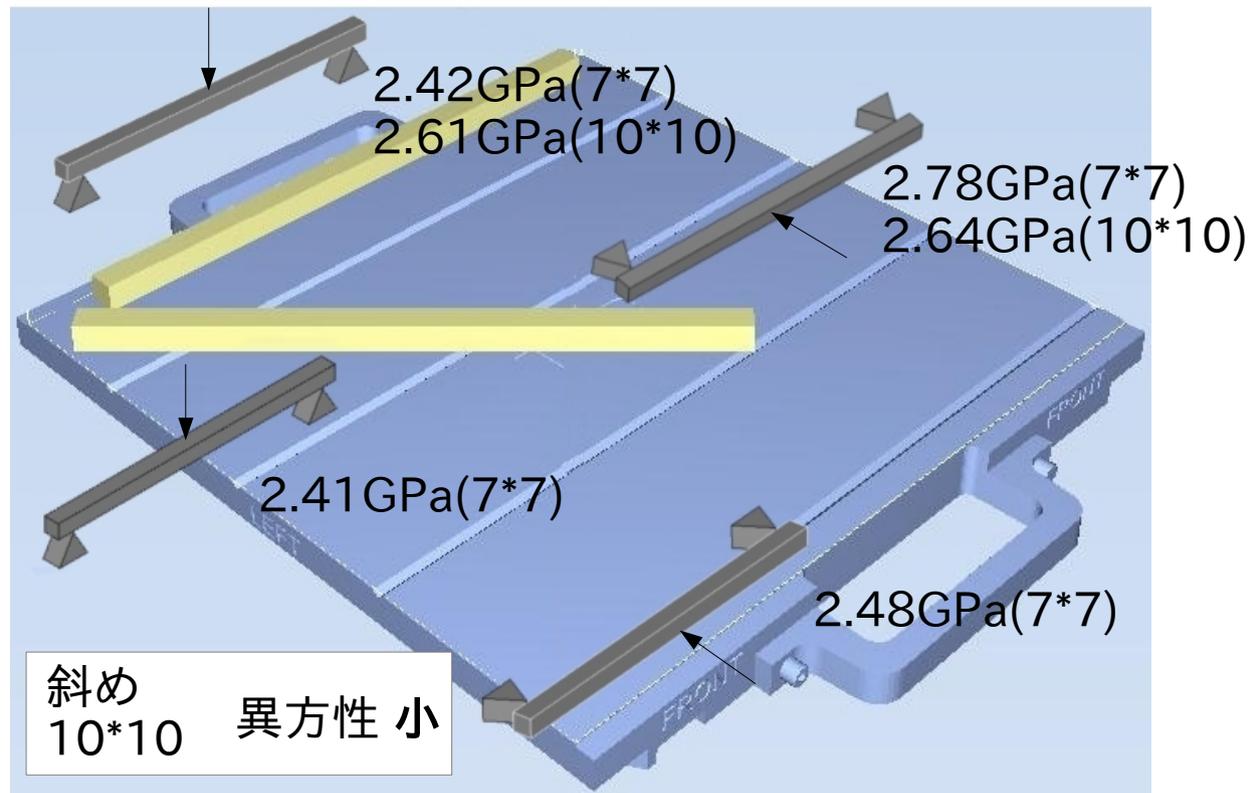
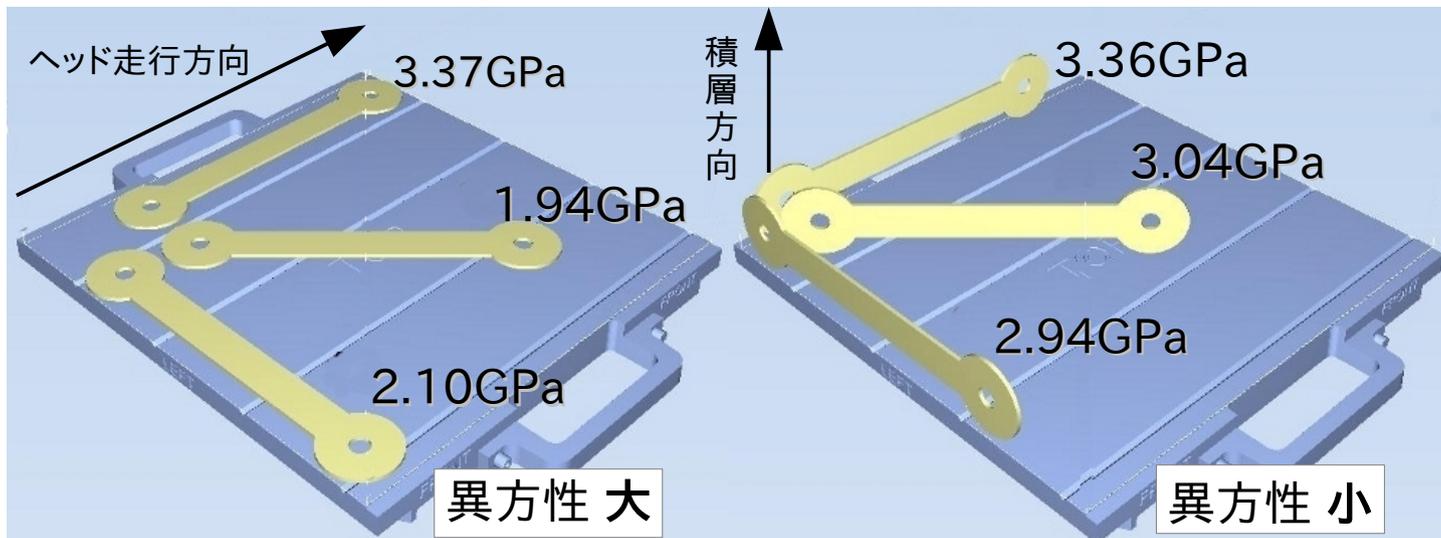
引張試験体



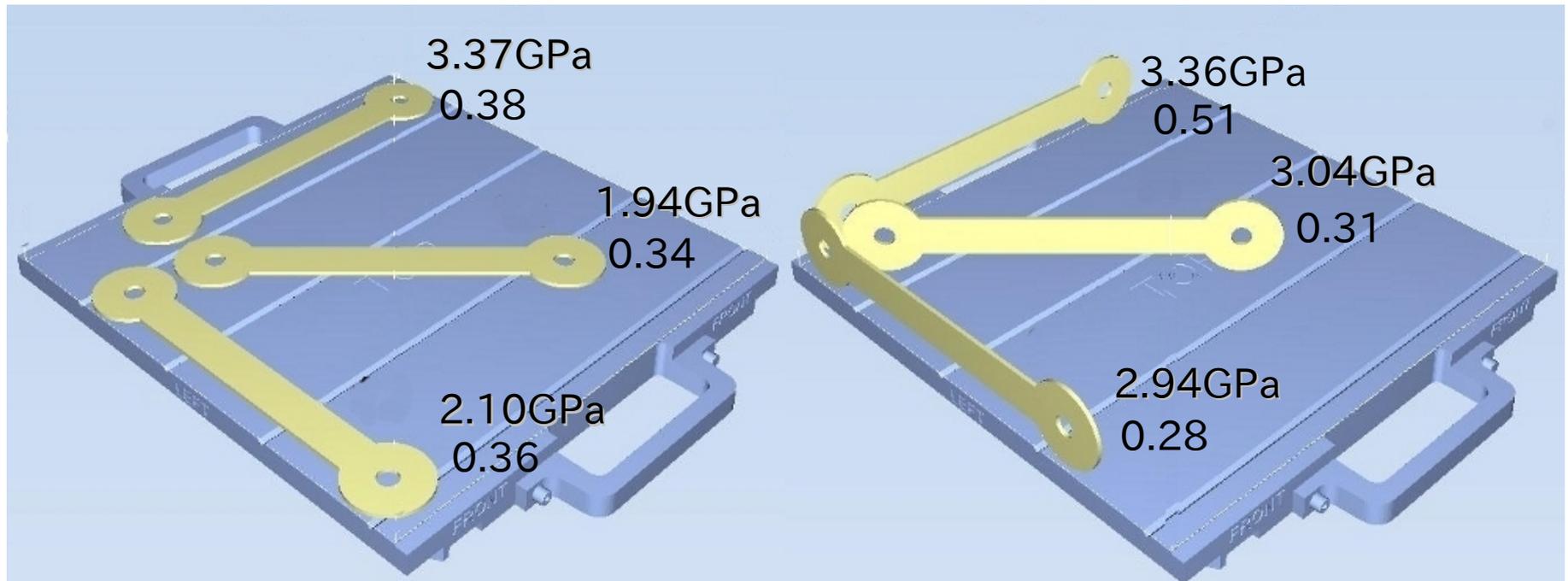
曲げ試験体



試験結果



引張試験体のポアソン比



$$\text{ポアソン比} = \frac{\text{横ひずみ}}{\text{縦ひずみ}}$$

$$G = \frac{E}{2(1 + \nu)}$$

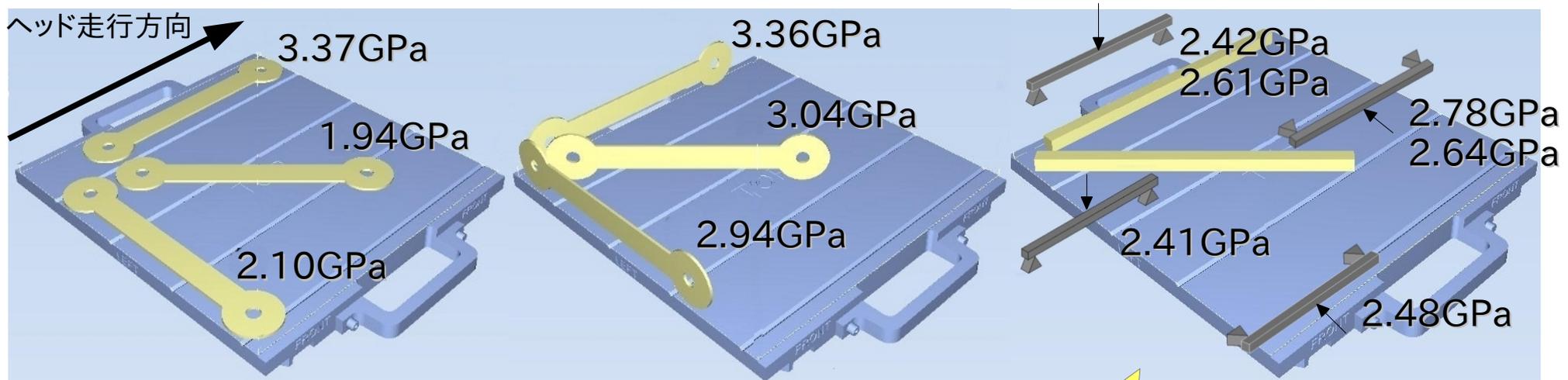
G:せん断弾性係数
E:ヤング率
 ν :ポアソン比

ポアソン比は、ほぼ一定



せん断弾性係数も
ヤング率と同様に影響

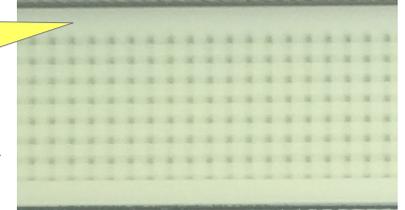
まとめ



厚肉構造は異方性 小



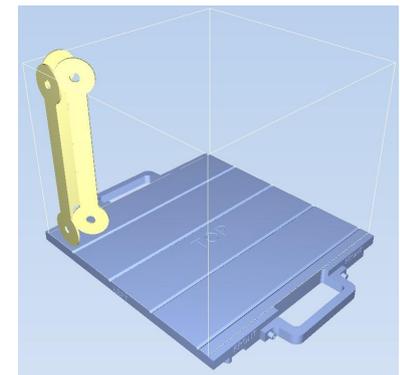
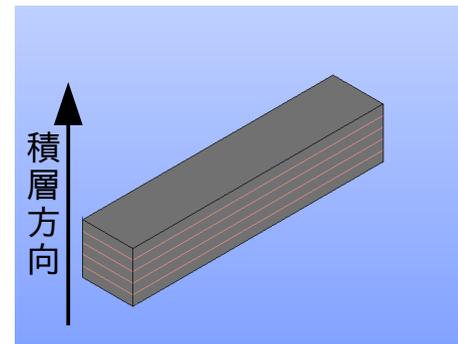
網目状の構造が
異方性を小さく



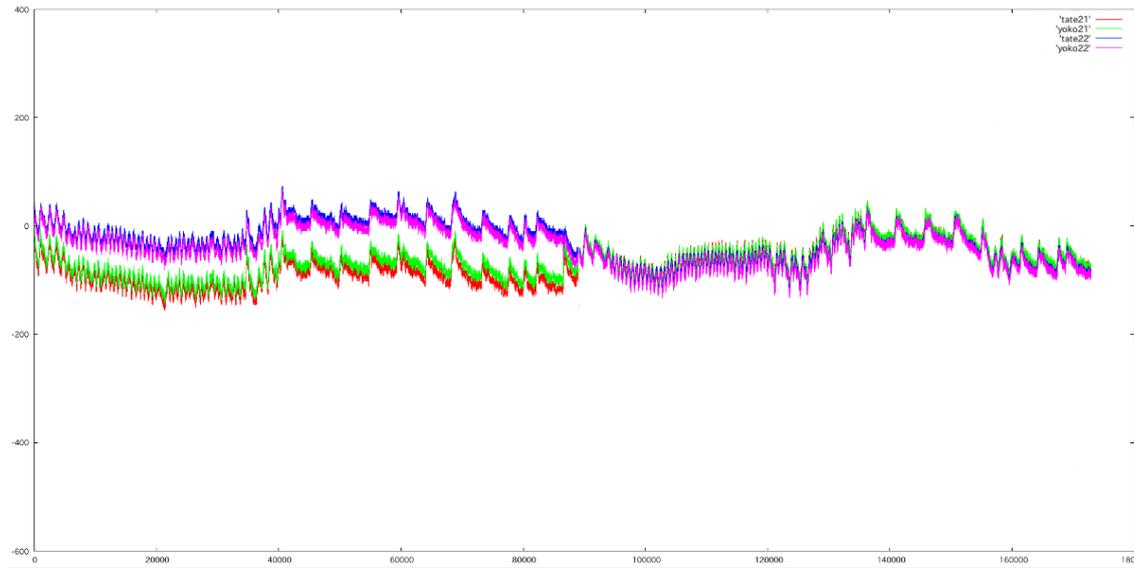
FEMと比較が可能

今後は、

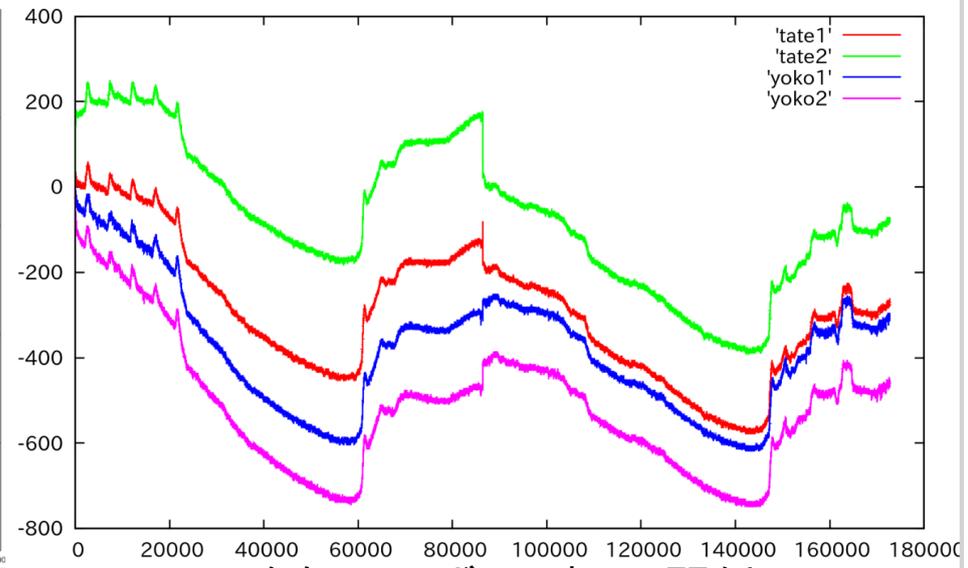
- ・積層方向の層の影響を検証
- ・網目の入らない材料で、異方性チェック



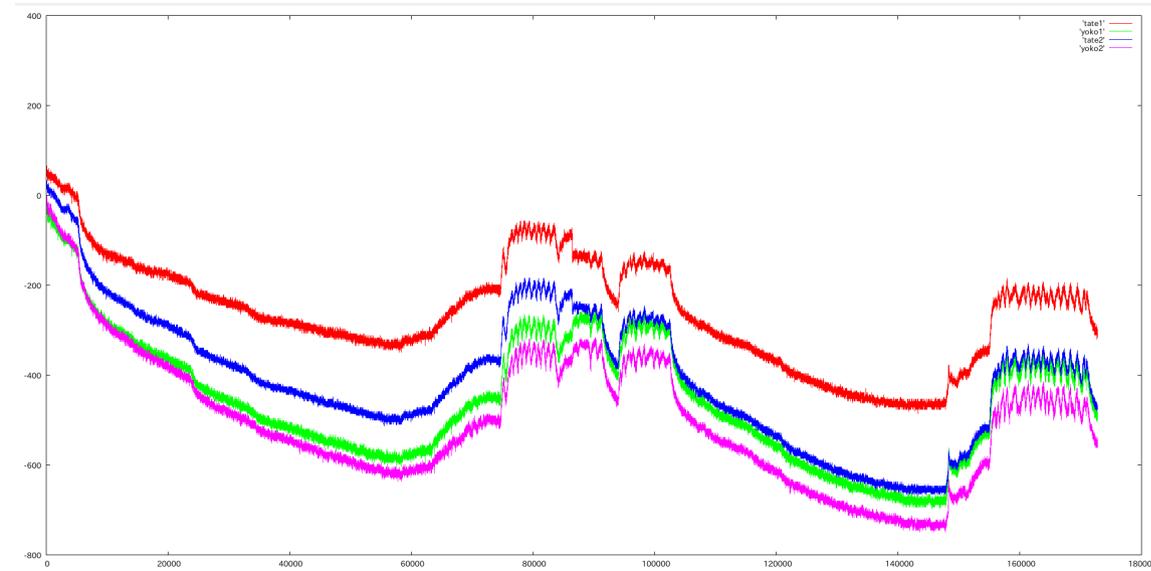
引張試験におけるクリープについて



試験体11のひずみ-時間 関係



今年のひずみ-時間 関係



試験体23のひずみ-時間 関係