

# Evaluation and consideration of local specimen material properties in lifetime prediction of short fibre reinforced PA6T/6I

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## Abstract

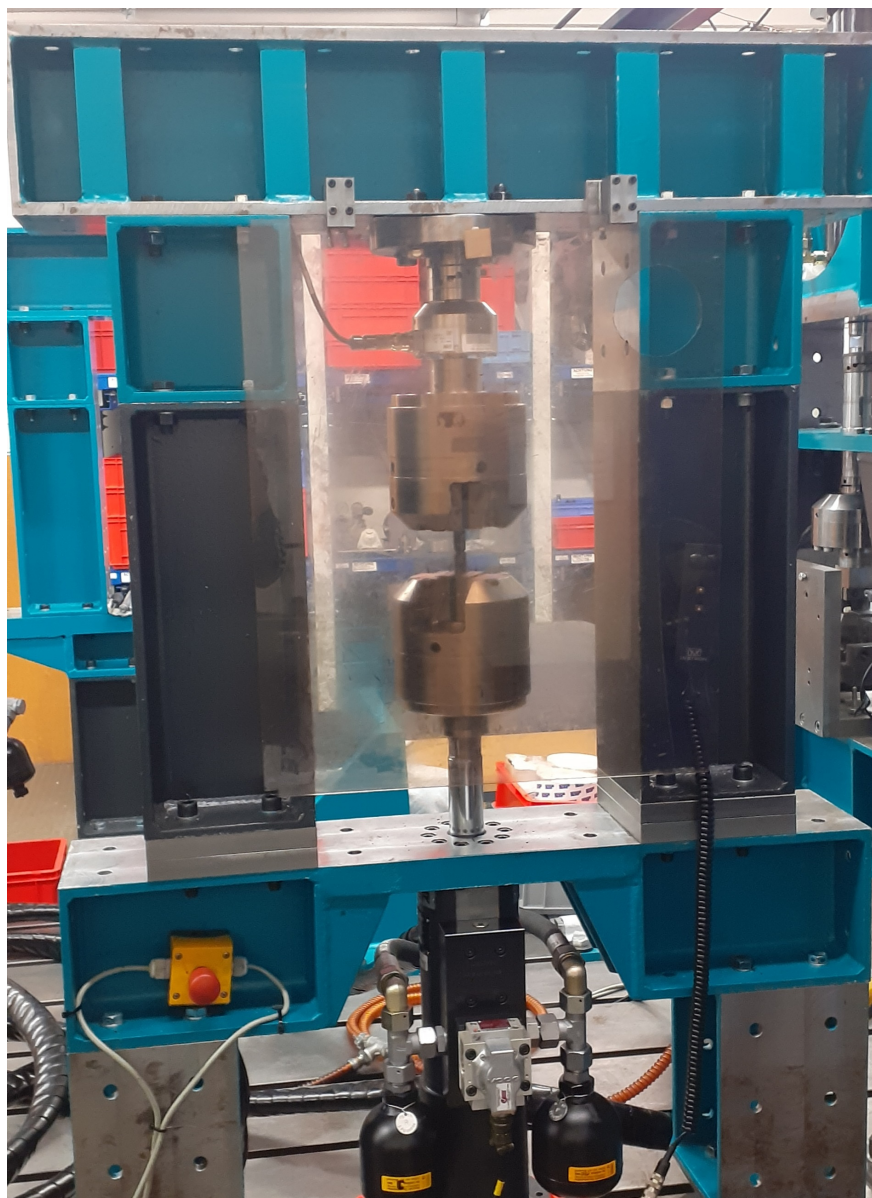
To exploit the full material potential of short fibre reinforced PA6T/6I, specific component calculations including anisotropic material behaviour is necessary. For this, different failure criteria and fatigue models are used to describe the behaviour during a component service life. This paper deals with the determination and consideration of fibre orientations for failure criteria and fatigue calculations. Therefore, a novel method to determine fibre orientation (FO) distributions across injection moulded plates, is proposed. The developed method allows a forecast of FOs for different specimen extraction positions and angles on injection moulded plates by using only a few measured reference points. As a result, fatigue models can be calibrated with the strength values and the corresponding FO, calculated for fracture position. The performed tests show a non-negligible influence of failure positions, due to fibre orientation distributions along the specimens. So, the FO determination method delivers an improvement in strength values estimation.

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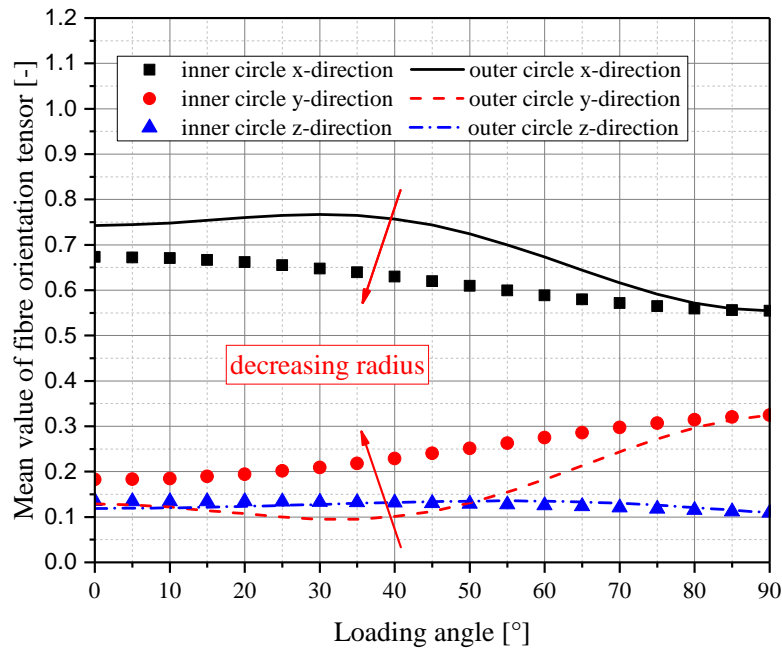
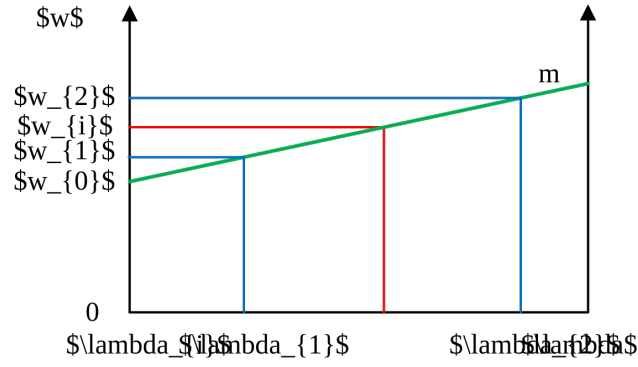
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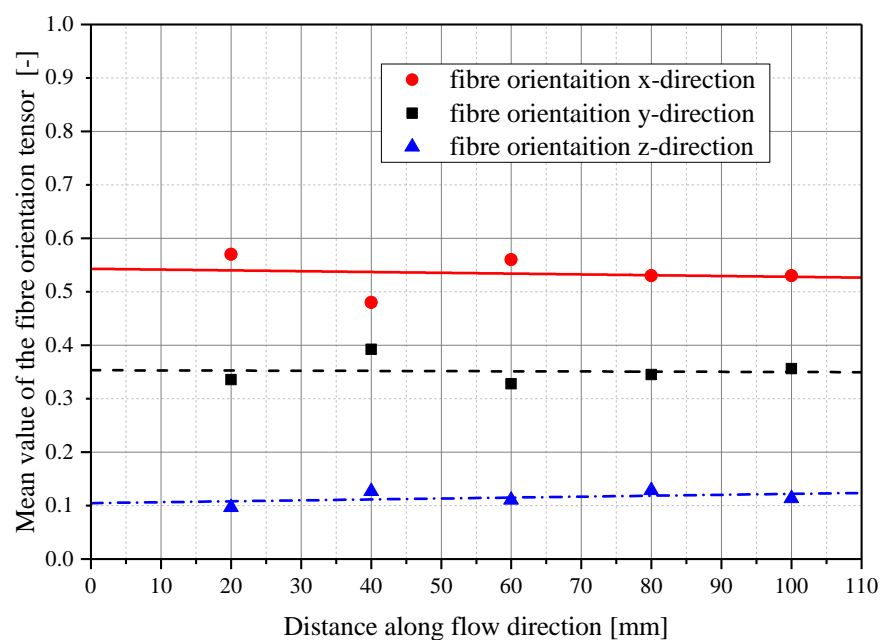
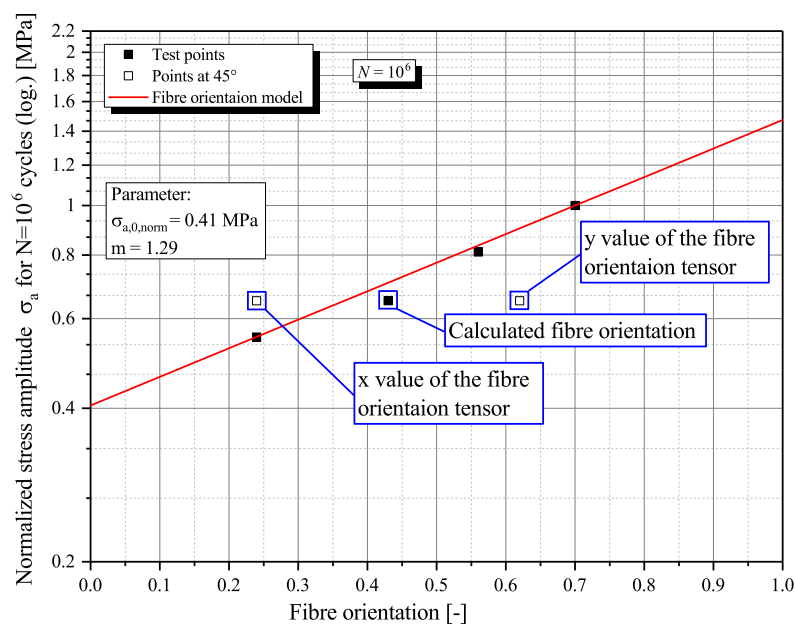
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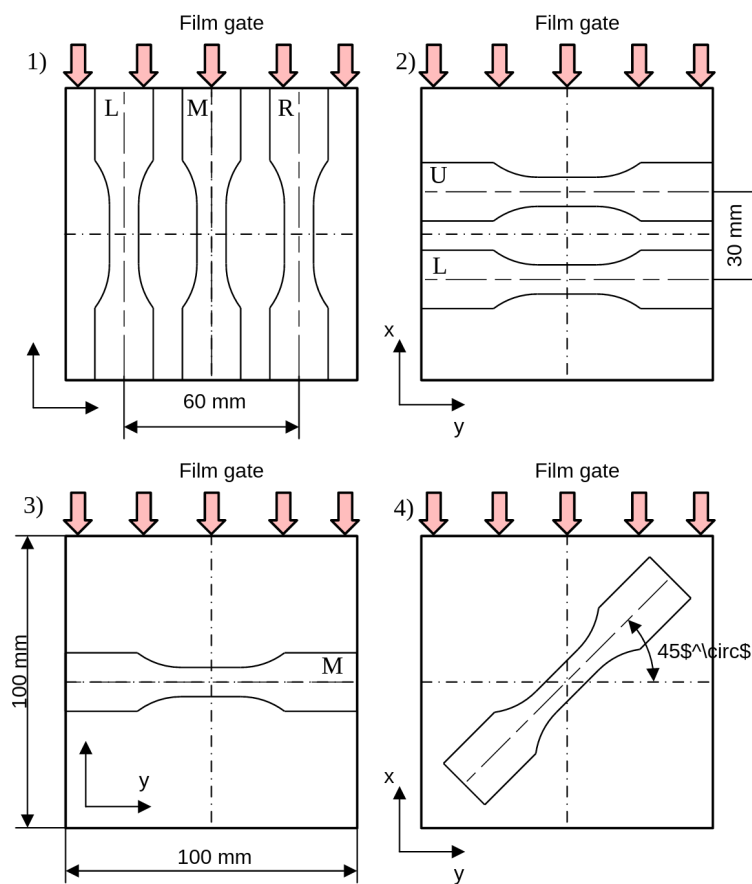
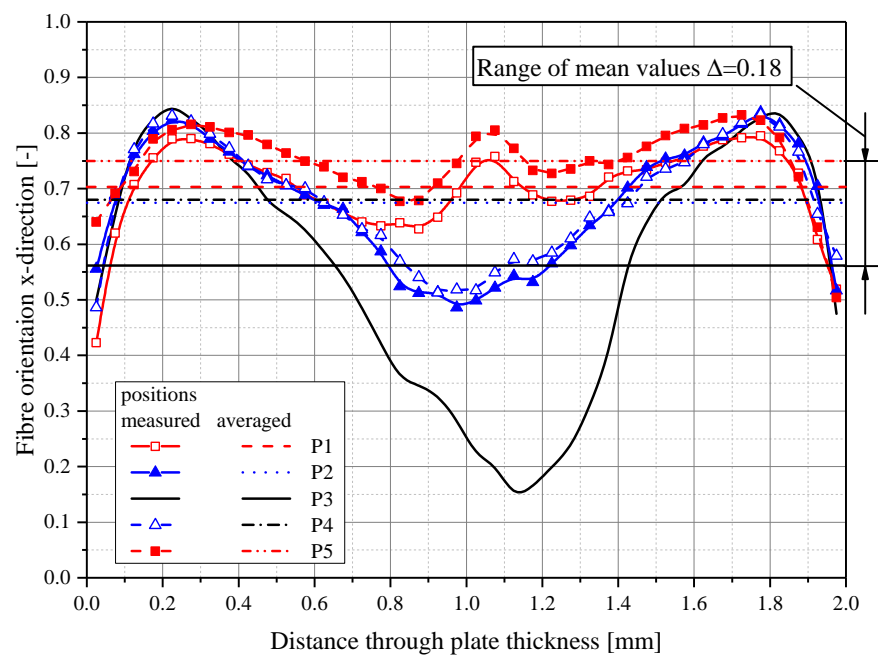
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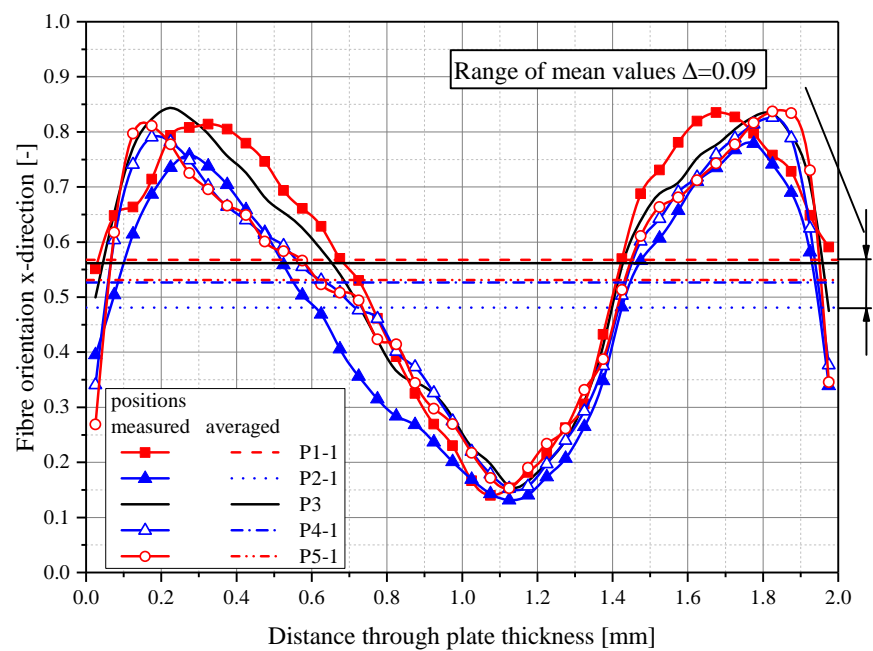
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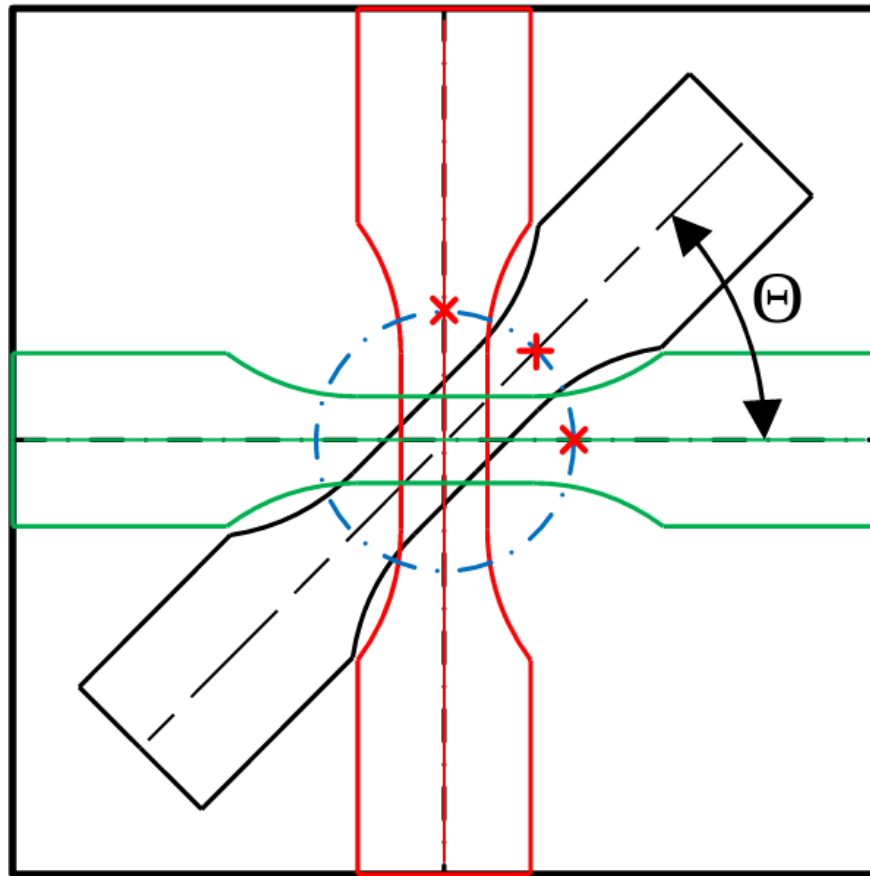
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× Point of fracture



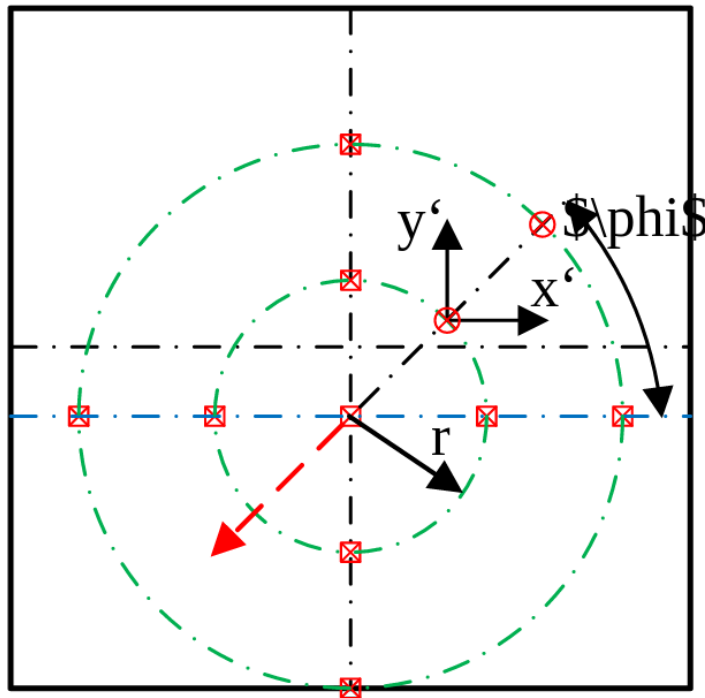
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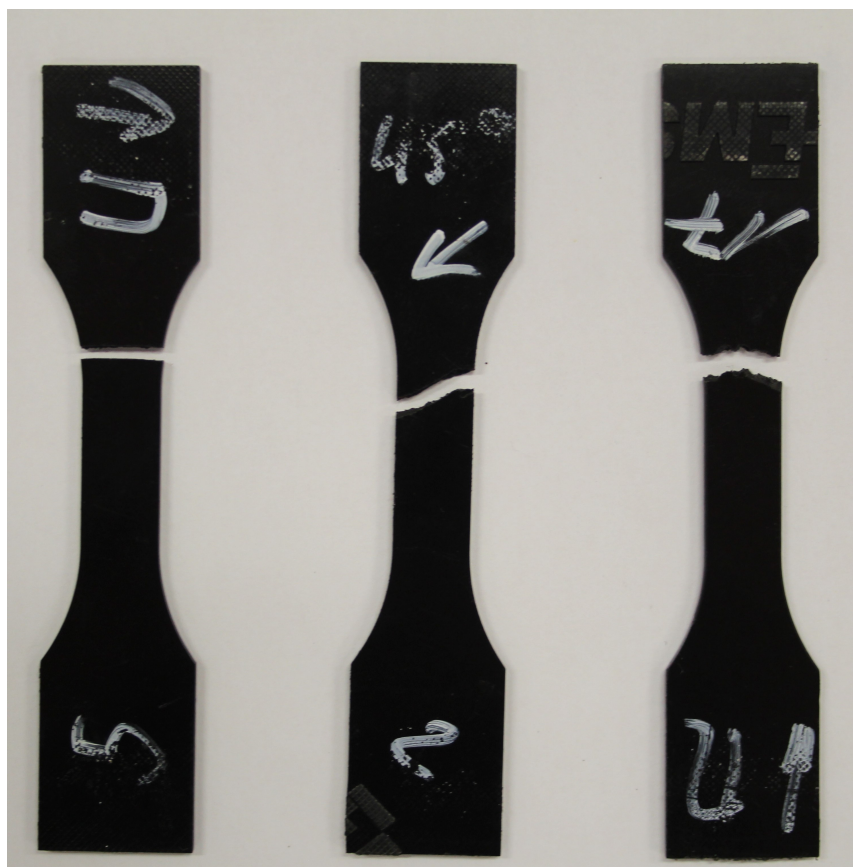
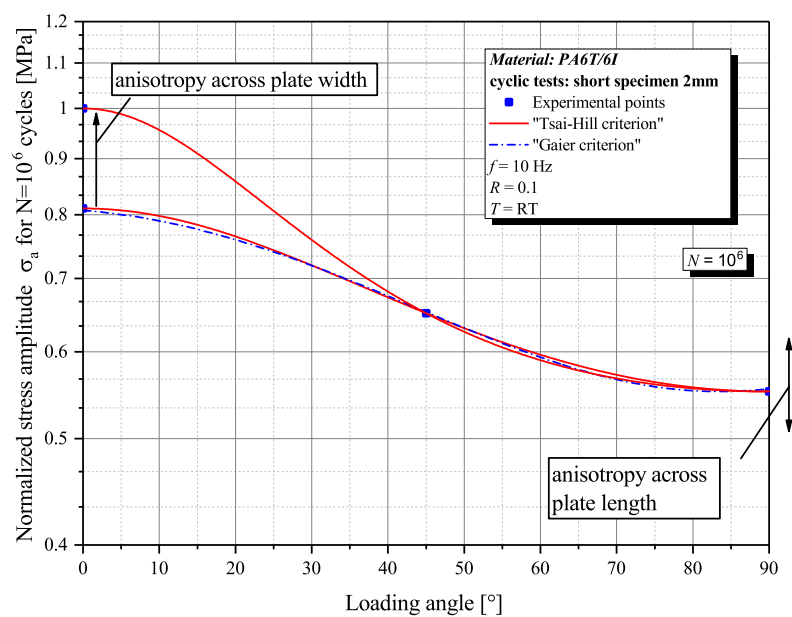
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- ☒ Positions of  $\mu$ CT-scans
- ⊗ Positions of calculated fibre orientations
- → Loading direction



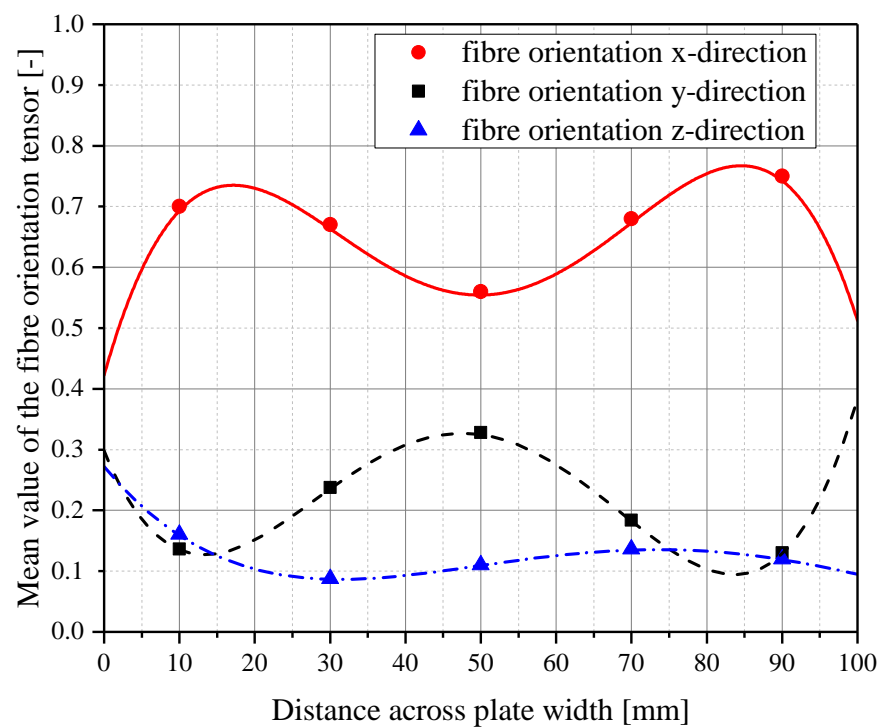
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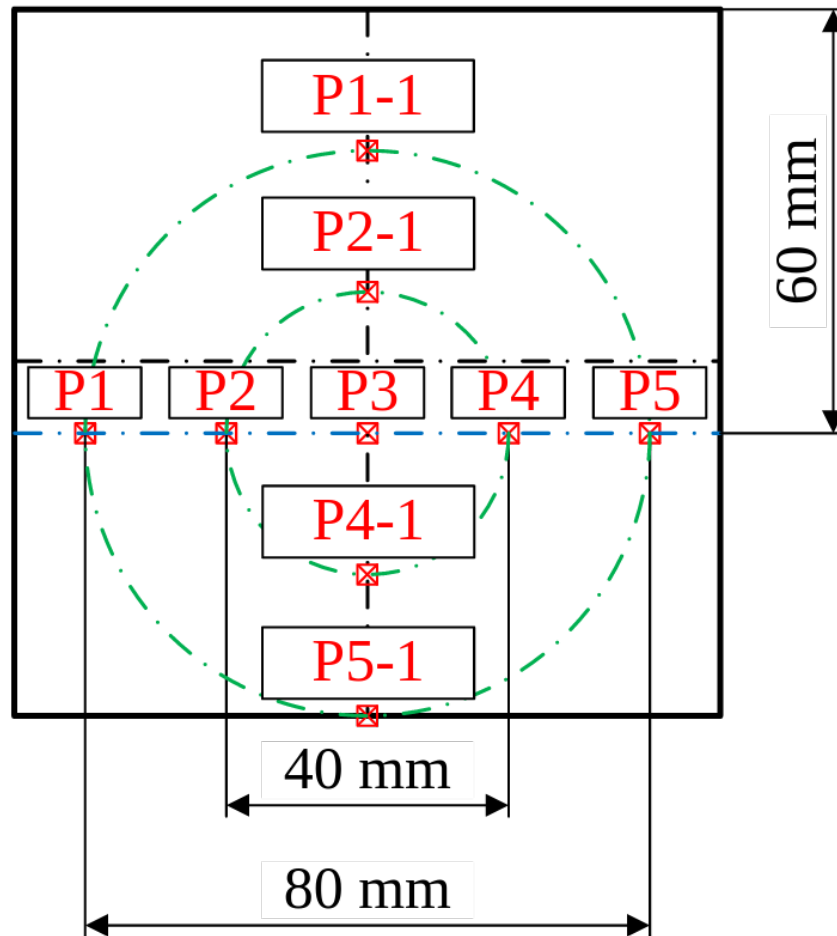


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## ☒ Positions of $\mu$ CT-scans

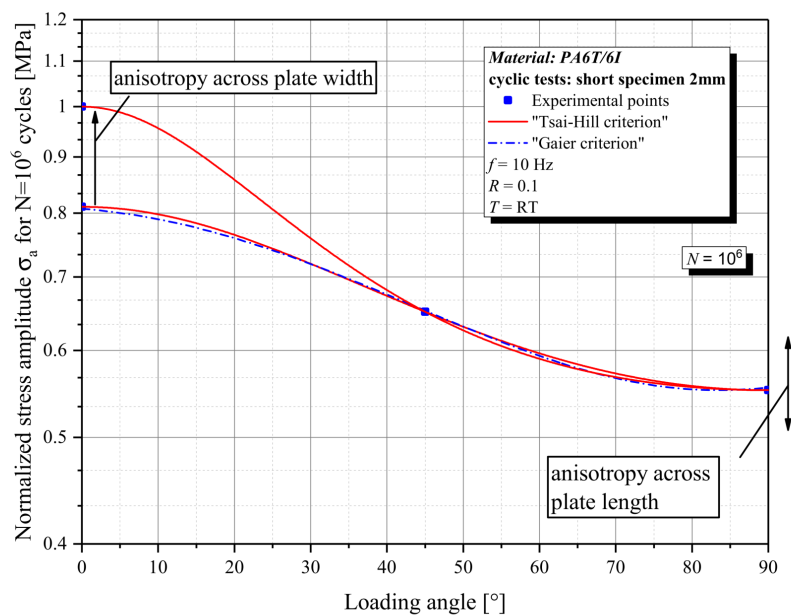
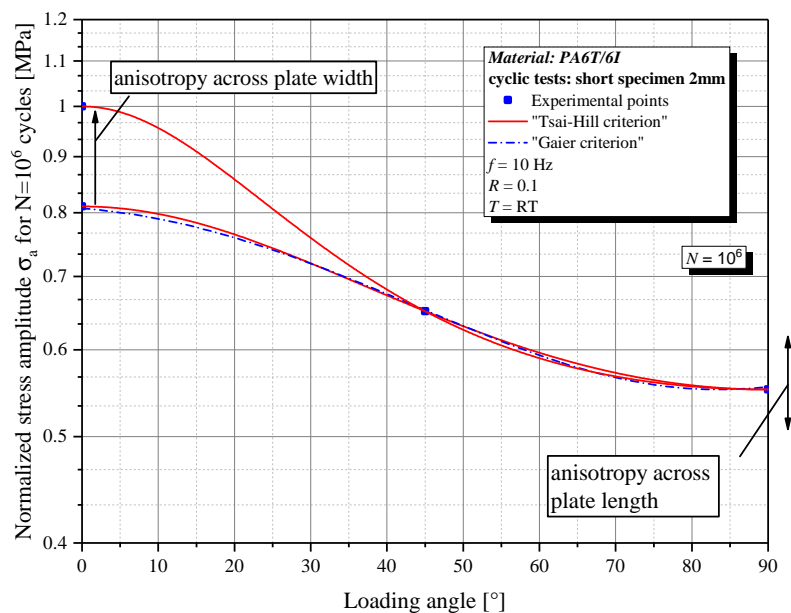


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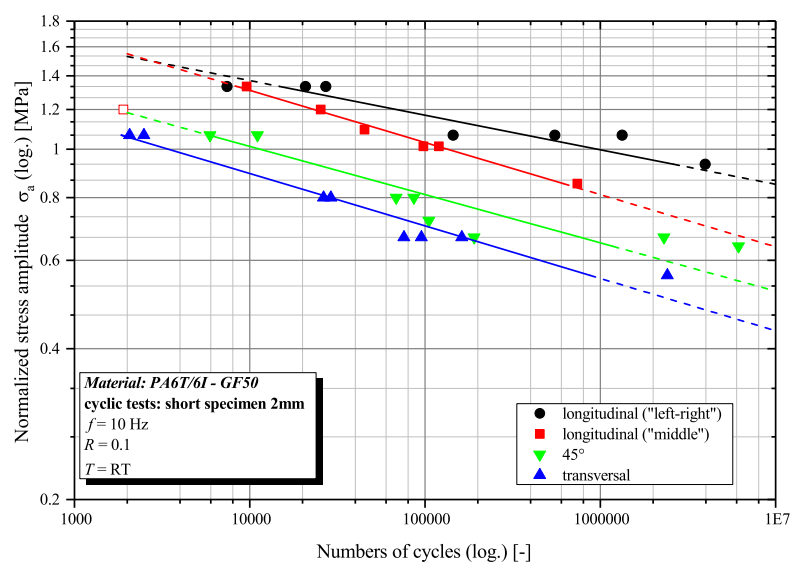
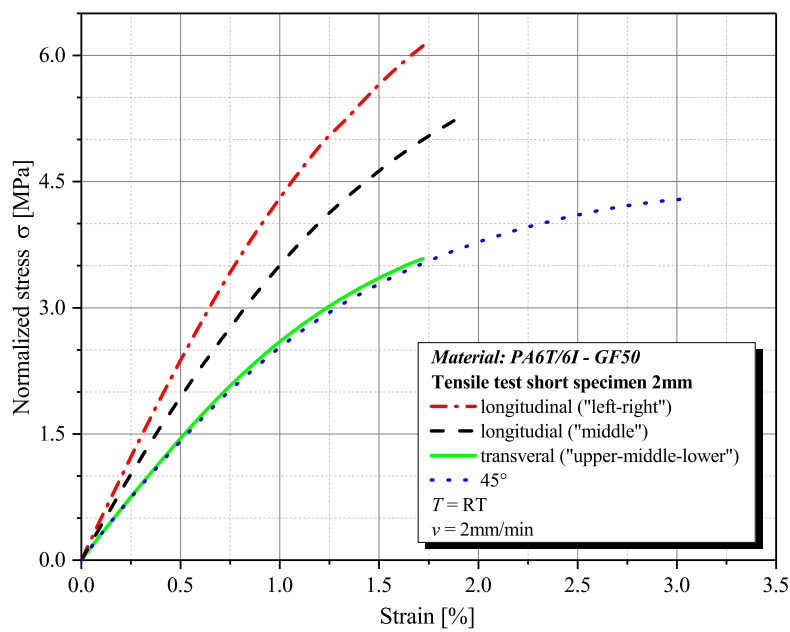
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