

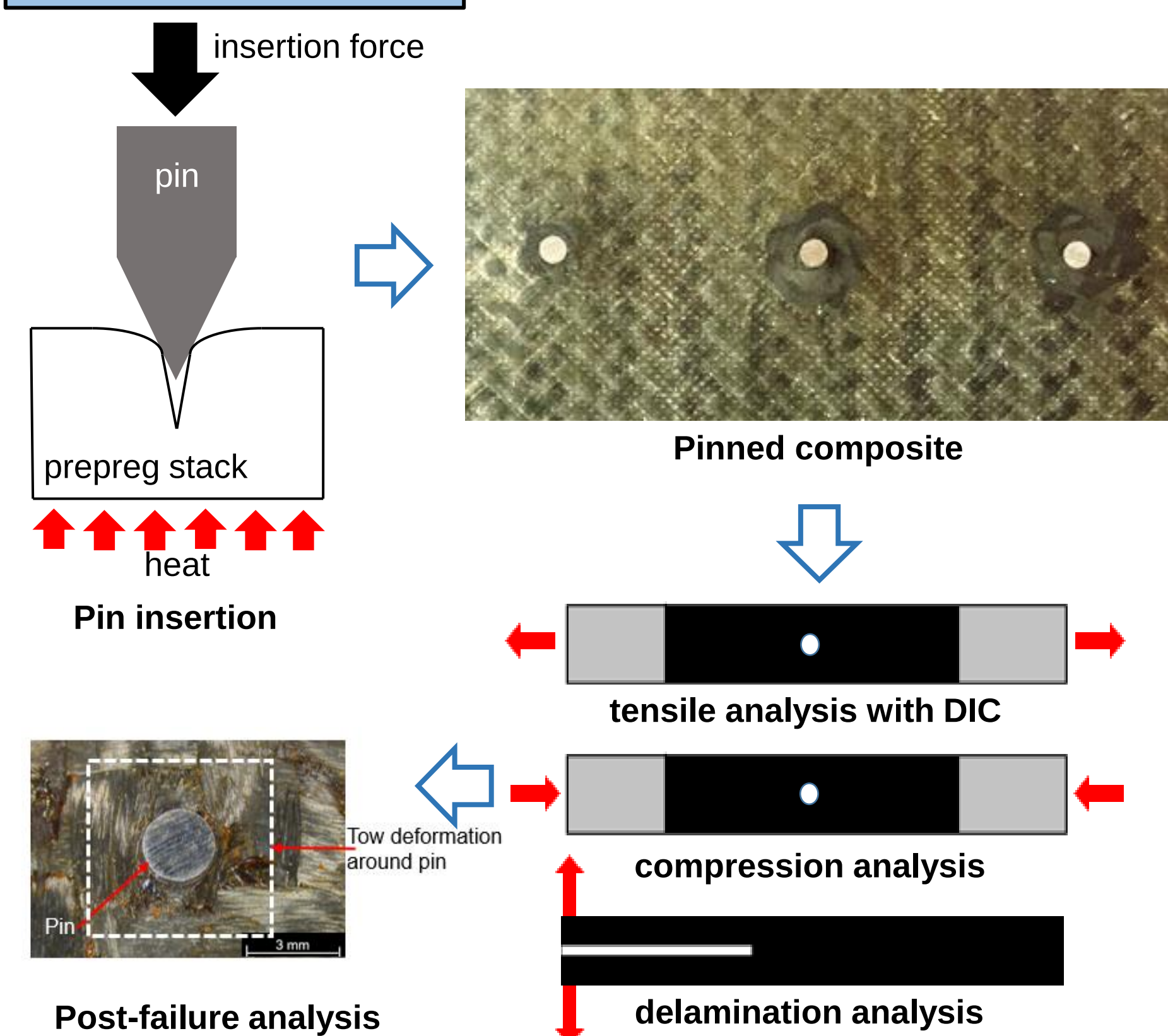
Characterisation of large diameter through-thickness metallic pins in composites

BACKGROUND

Previous work on the static of insertion of large diameter TTR pins into heated prepreg stacks for the purposes of integrating photonic sensors has proven a feasible and robust reinforcement process with low insertion forces and tow damage compared with existing methods for similar element sizes (>1mm diameter). The local mechanical performance and failure mechanics of these pinned laminates has not yet been reported.

Aim: Investigate the influence of varying diameters (1.2, 1.5 and 2.0 mm) of statically inserted pin diameters on in-plane and out-of-plane properties.

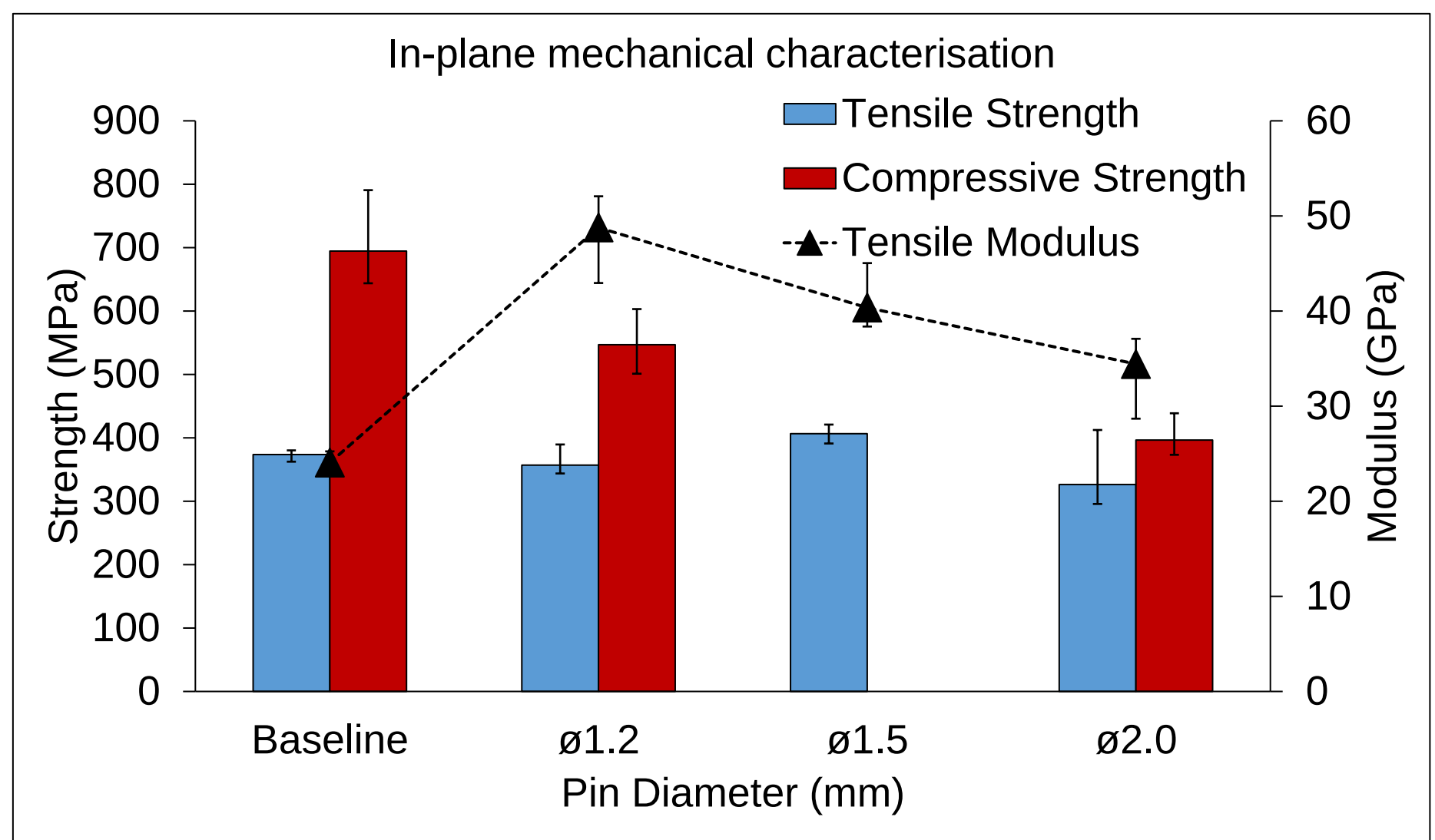
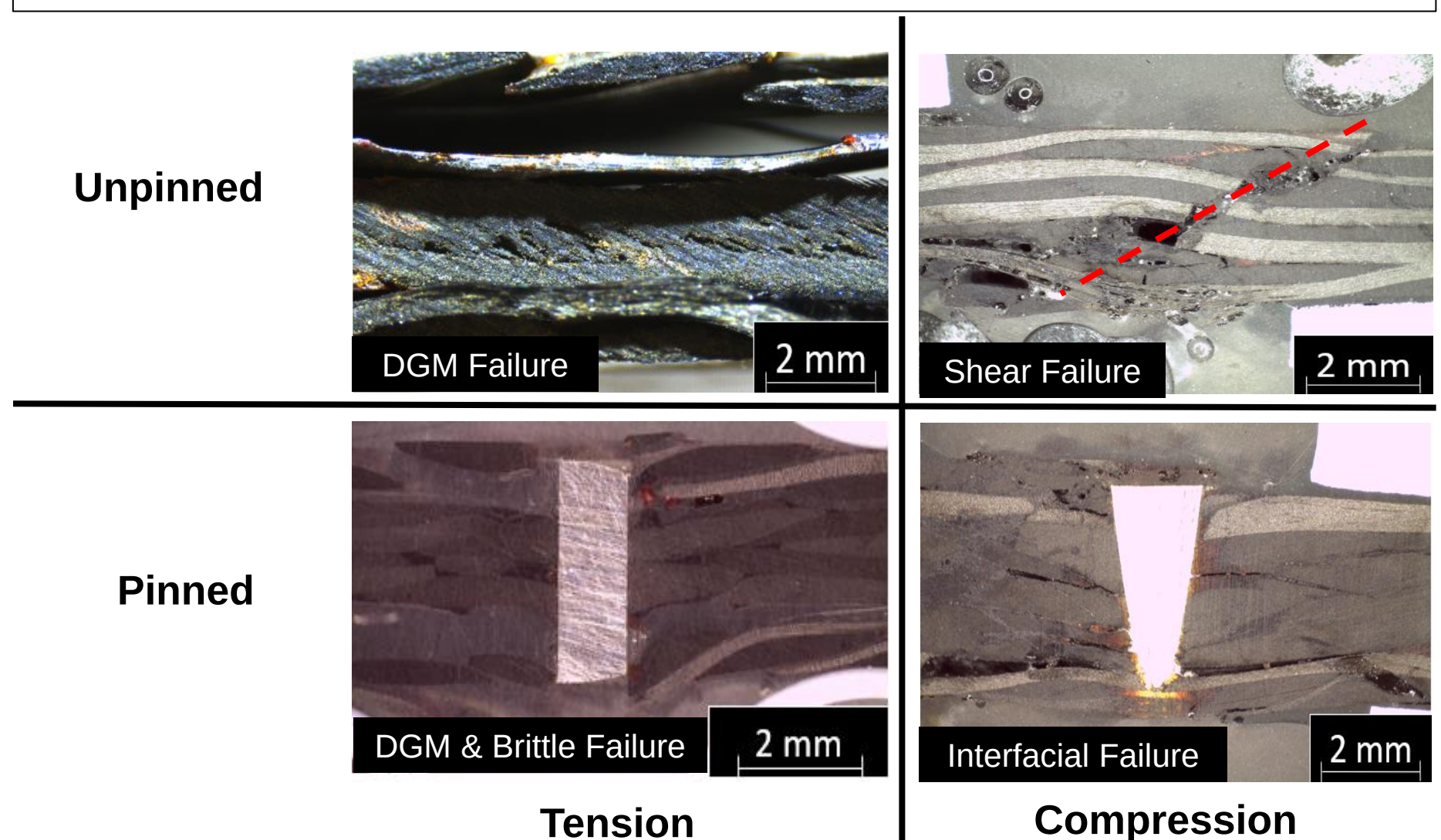
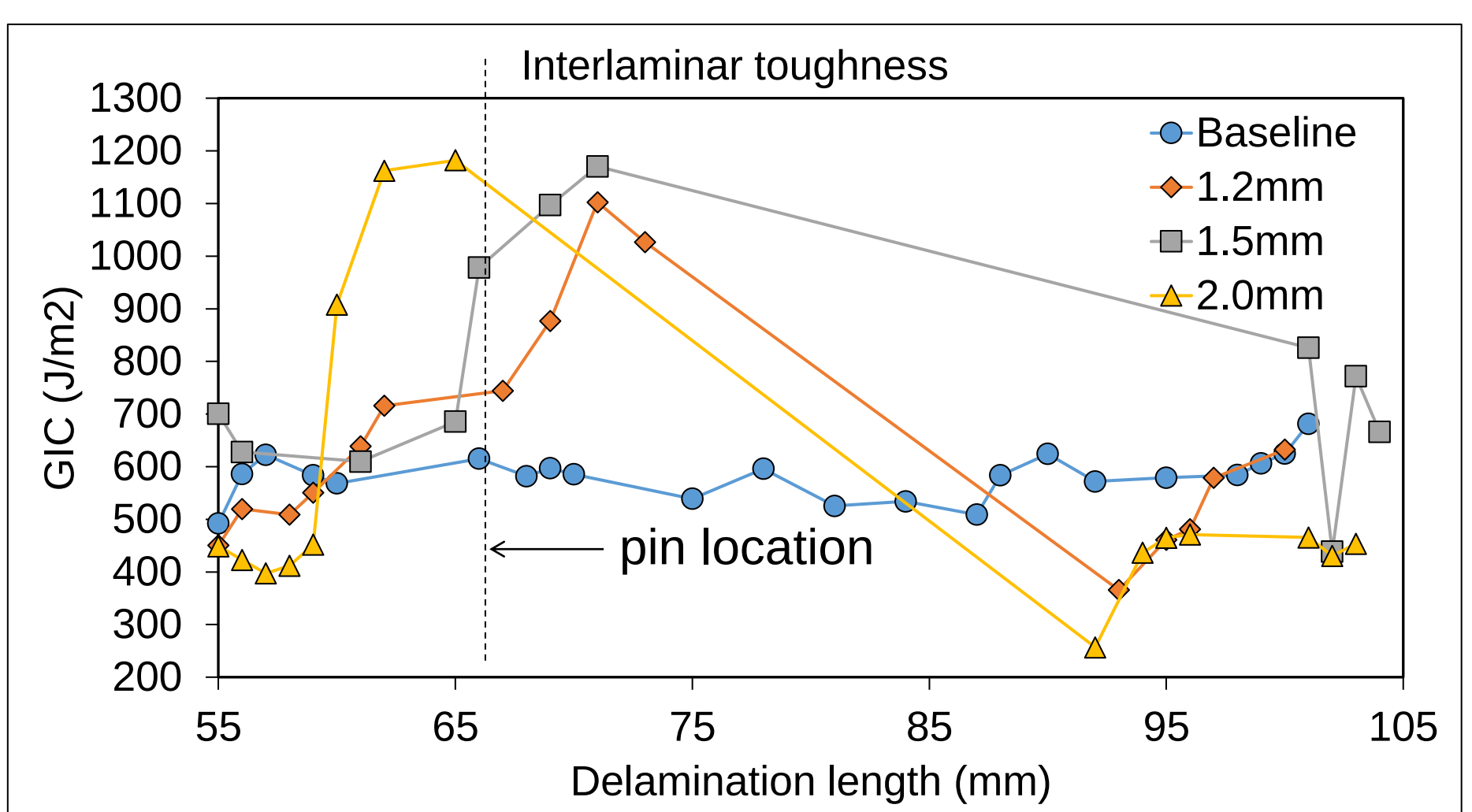
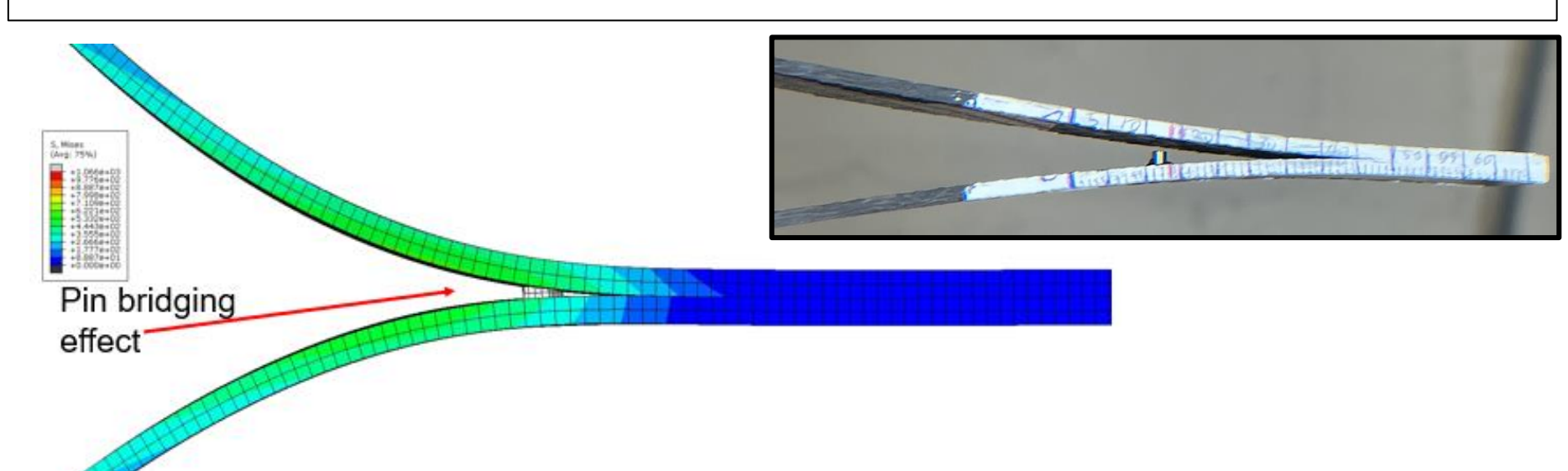
METHODOLOGY



CONCLUSIONS

- Tensile strength unaffected by the presence of pins up to $\varnothing 2$ mm; modulus is improved.
- Degradation in compressive strength of up to 42% in $\varnothing 2$ mm pinned samples.
- Doubling of G_{IC} in pinned samples, but unaffected by pin diameter; toughness peaks move forward.

RESULTS



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