



# Project II: Development of Improved Hybrid Joints for Composite Structures



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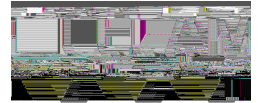
**Objective** – Develop a new hybrid joint using attachments to achieve significantly greater joint strengths

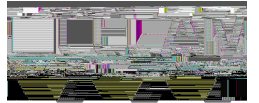
**Approach** – a new hybrid joint design was proposed for composite lap joints, which use a small flat piece of composite laminate attachment to create an alternate load path to transfer part of the load from the adherend to the bolt

# Conventional Hybrid Joint

**Bolts are idle until adhesive bond fails**

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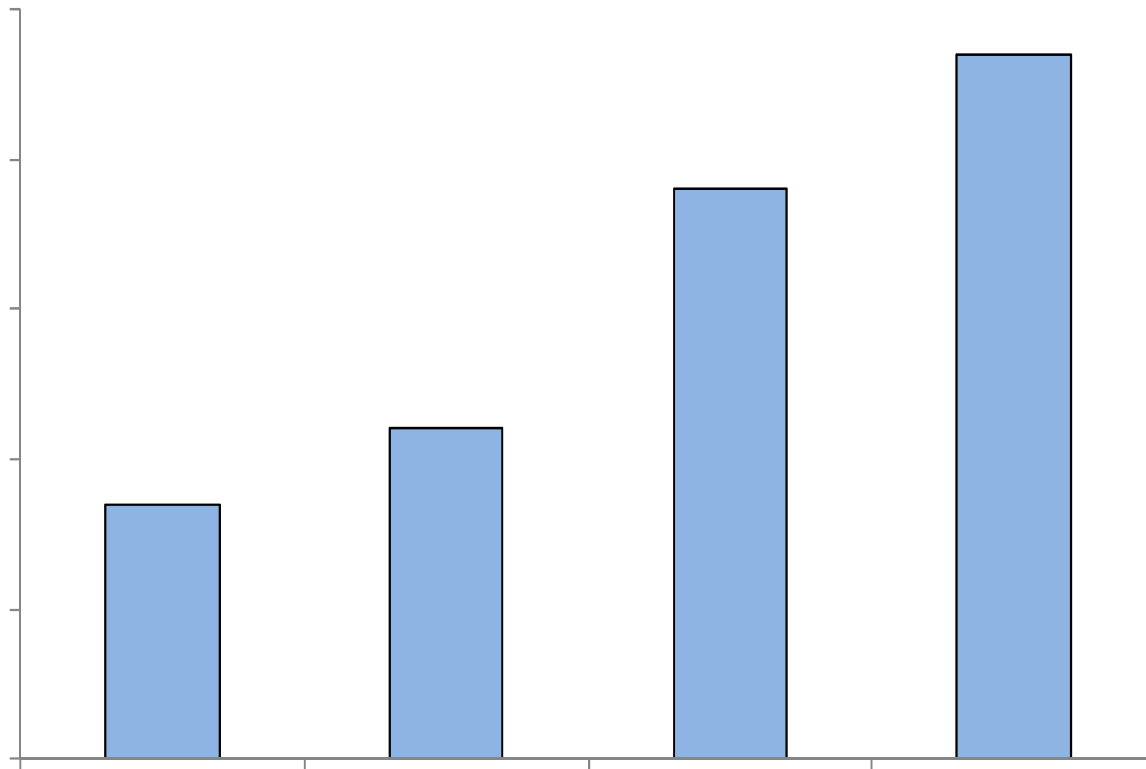
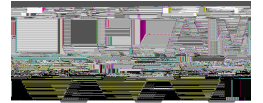
# Comparison of Different Joint Designs

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# Comparison of Joint Strengths

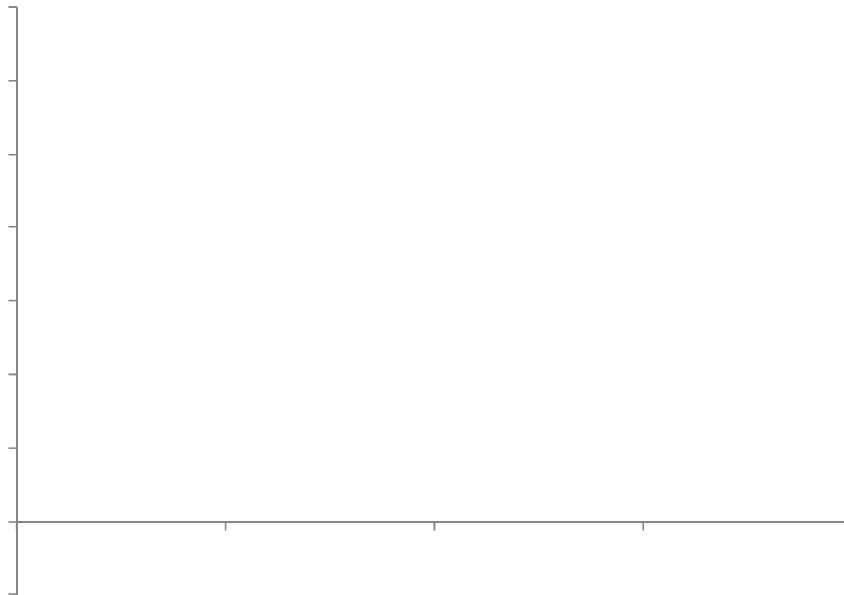






# Effect of Attachment on the Main Interfacial Peel Stress Distribution

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# Project II Conclusions to Date

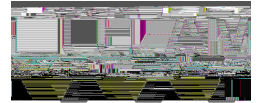
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- The new design of hybrid joint can invoke the bearing capability of bolts and significantly increase the joint strength from the beginning of its service
- The hybrid joint with stepped attachment further increases the joint strength

# A Look Forward

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- **Future Needs**

