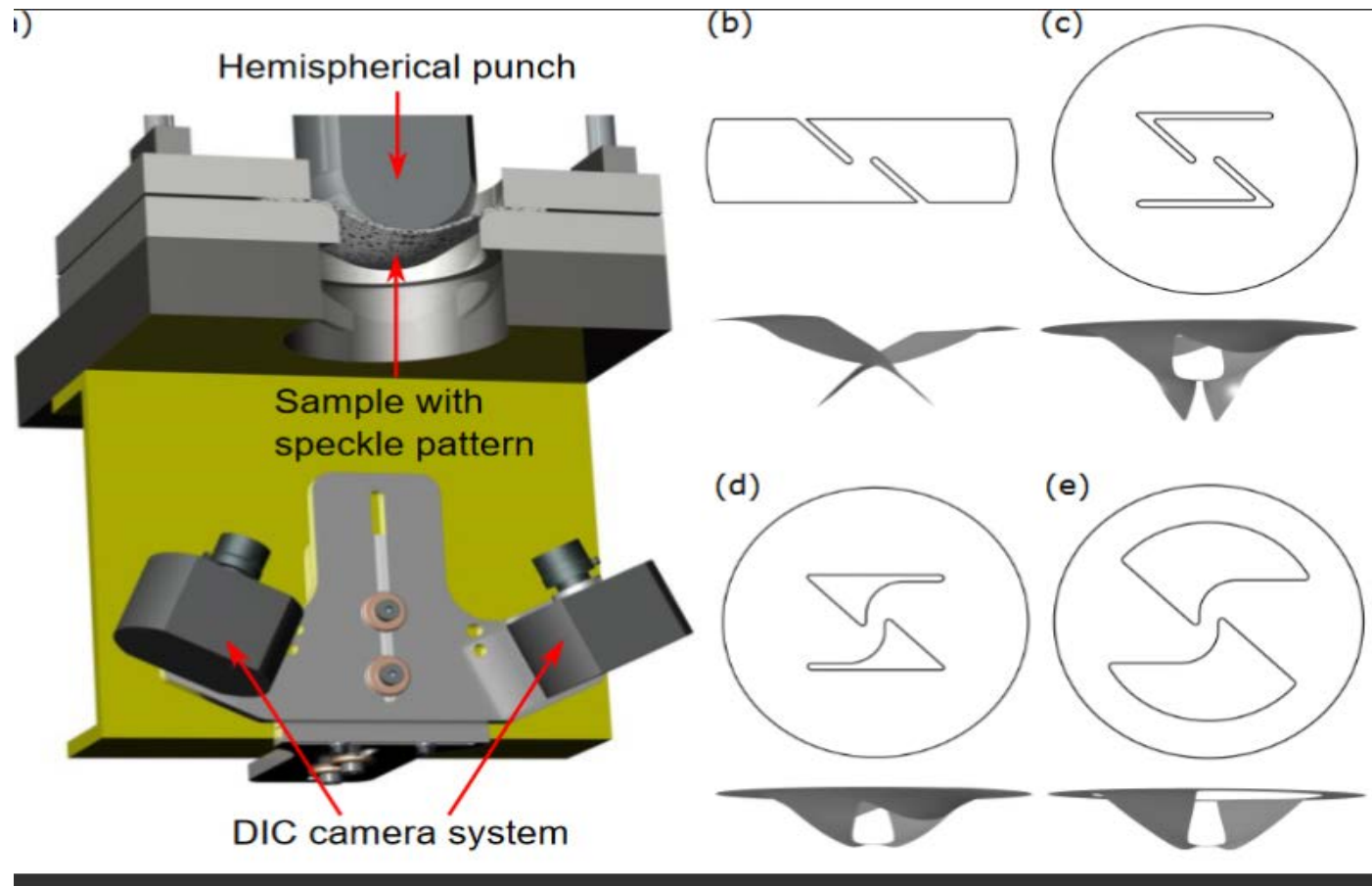


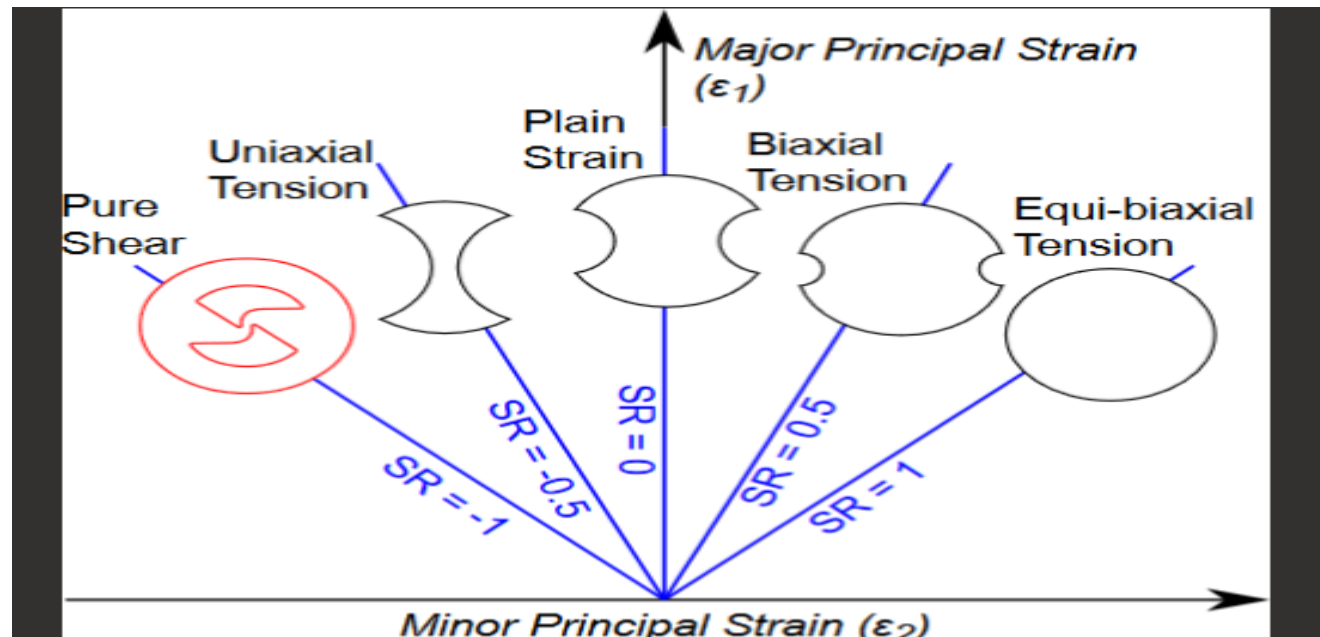
What is shear failure and what does it mean in establishing failure metrics for composite materials?

- Our philosophy of testing



What is different to testing schemes currently existing

- The purpose is to use one experimental methodology/apparatus
- The key aspect is varying the geometry of specimens to induce different deformation modes and study the effects of path dependency of loading to elucidate the failure for different deformation modes.

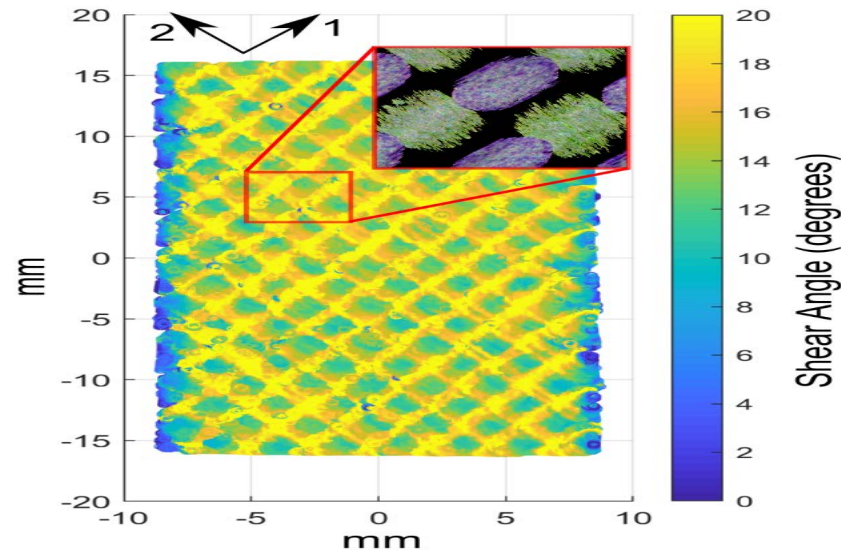


Is it interesting.?

- 1. Shear strain and failure behaviour vary extensively with material.

Influenced by material properties (fibre and matrix) and weave (style and size); finer weaves, stiffer materials can have more localised shear region, larger weaves and softer fibres can lead to larger shear region.

- 2. DIC shows mesoscale variation of deformation with relation to weave. Somewhat visible in S-specimen but clear in 45 degree off-axis tensile test which shows higher shear in resin rich region between fibre tows using DIC for plain woven carbon-fibre / PEEK composite.



Some discussion points

- Is shear failure dominated by matrix? Conventional wisdom at least to my limited knowledge of thermoset composites. I am fairly confident that it does not work for thermoplastic woven composites.
- Are there load transfer issues that needs to be accounted in coming up with failure metrics?. If so how they can be incorporated in a simulative FEA at element level or what level?