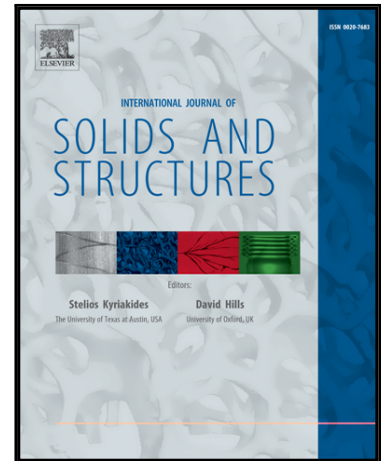


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Toughening of thin ceramic plates using bioinspired surface patterns

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Highlights

- Laser engraving of narrow trenches on the surface of thin alumina plates can guide the propagation of in-plane cracks
- The apparent toughness of these “interfaces” can be tuned by changing the depth of the trench.
- The overall fracture toughness of the plate can be improved by engraving transverse interfaces or sinusoidal interfaces.
- Complex architected and mechanisms are possible: bio-inspired sutures resembling an interlocking jigsaw generate high toughness, frictional pull-out, and completely transform the way the material deforms and fails in tension.

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