

ABSTRACT SUBMISSION



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Textile Structures with Negative Poisson's Ratio

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ABSTRACT (NO MORE THAN 500 WORDS:)

Textile structures with negative Poisson's ratio are a special class of textile materials. Known as auxetic textiles, they transversally expand when axially stretched or transversally contract when compressed. This nonconventional deformation behavior leads to a series of special properties of textile structures such as formation of dome shape under out of plane bending, increase of pore opening effect under extension, enhancement of energy absorption ability and indentation effect under impact force, etc. In this talk, different types of textile structures with negative Poisson's ratio which have been recently developed at PolyU will be presented, including auxetic plied and braided yarns, 2D and 3D auxetic weft and warp knitted fabrics, uni-stretch and bi-stretch auxetic woven fabrics, and 3D auxetic textile structure and composites. Auxetic behavior and mechanical properties of these textile structures obtained from both experimental and theoretical analyses will be discussed. In addition, potential applications of auxetic textiles in different areas will be demonstrated.