

## عنوان مقاله:

Large anti-plane shear deformation of nonlinear composites reinforced by elliptic fibers

## محل انتشار:

هفتمین همایش انجمن هوافضای ایران (سال: 1386)

تعداد صفحات اصل مقاله: 10

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## خلاصه مقاله:

A closed form solution is obtained for a composite cylinder with elliptical cross-section undergoing finite antiplane shear deformation. The analysis is based on the theory of hyperelasticity and is carried out when the composite cylinder is made out of a reinforcing elliptic fiber and a confocal coating, both characterized by incompressible neo-Hookean strain energies. The problem for a class of compressible neo-Hookean material is also studied. The analytical results are compared with corresponding numerical simulation where excellent agreement is found. The composite cylinder is utilized as the building block of a mesogeometry, modeling a class of fiberreinforced composites. These two-phase composites are consisting of a "composite elliptic cylinder assemblage" in which all cylinders have different eccentricities but possess the same orientations, volume fractions and fiber aspect ratios. Based on this modeling explicit relations for the macroscopic nominal stress as well as effective secant axial shear moduli of such composites are obtained.

## کلمات کلیدی:

Overall constitutive law-Hyperelasticity-Elliptic composite element

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/55627>

