

Static Response of Planar Compliant Devices with Small-Deformation Flexure Hinges

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ABSTRACT

The article presents a static load-displacement calculation procedure for planar compliant mechanisms with small-deformation flexure hinges. The approach utilizes the Castigliano's displacement theorem and enables consideration of both rigid links and flexure hinges in a unitary manner. The flexure hinges are modeled as complex springs, which are capable of elastic response to bending axial and shearing loads through corresponding compliance factors. The compliance factors are directly incorporated into the generic formulation and this feature enables implementation of various flexure configurations. This method is particularly useful in calculations of flexure-based compliant devices where the quasistatic response needs to be determined accurately. An example is studied by the proposed

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