

Structural Optimization of Motion Structure Using Constraint Force Design Method

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This research develops a new structure optimization method for foldable motion structure with repeated rigid-body mechanism cell. Compare with conventional rigid-body mechanism, they are many kinematic advantages of a motion structure as it can achieve large shape transformation for real applications such as satellite solar panels, space antennas to shelters, and swimming pool covers. Until now some conventional linkage, i.e. closed loop of 4 bar linkages have been used for designing motion structure for various purpose. Then for, it is difficult to find out an optimal rigid-body mechanism cell for motion structure. In this research, to overcome the limitation of simple motion structure, we develop a new structural optimization method by applying our recent contribution constraint force design method for motion structure.