

Concept Development and Design of a Flexible Metallic Wheel for Space Rover Using FEM Analysis

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Abstract. In the contribution, various designs of flexible wheels for space rovers are modelled and analyzed. Static mechanical finite element method (FEM) analyses were performed using the proposed methodology. A flexible wheel is made of three parts (rigid hub, outer rim, and spokes). The objective of this work is to construct a suitable conceptual design for the spokes (springs). The flexibility of the wheel must meet predetermined geometric, performance, and safety criteria. After various results from FEM analysis, the most suitable parameterization and material are selected.