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Near Term Strategies for Lunar Surface Infrastructure (1)

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DYNAMICS SIMULATION OF CHANGING DIAMETER FOR A FLEXIBLE DIAMETER-VARIABLE
WHEEL OF LUNAR ROVER

Abstract

Considering the nonlinear deformation of a patented Diameter-Variable Wheel of lunar rover on changing diameter, a FE(Finite Element) model which taking geometric stiffness into account was built through FEMBS(the interface with Finite Element software–Ansys and Multibody System software–Simpack). Based on continuous impact theory, rigid-flexible coupling dynamics simulation of the Diameter-Variable Wheel with six-flexible bodies was carried out by adding moved markers. Then two simulation models were set up respectively for different ways of changing diameter, and the comparative results were given. These studies provide the basis for fatigue life analysis and load verification.