Mathematical model for backup large-area solar battery disclosure system

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To improve rope systems multilink solar battery disclosure liability, the article proposes a backup disclosure system consisting of a lift mechanism (jack), driven by the electric drive and a rope system synchronization. The mechanism's main feature is a variable ratio depending on the first link steering angle. Rope synchronization system consists of a roller set connected by cables in a certain way, and the two types of gear mechanisms to ensure the required gear ratio. The article proposes the power mechanism schematic diagram and the synchronization system kinematics. The study derives the transmission dependence from the engine to the first link, gives a disclosure system mathematical model. In order to determine the disclosure process basic characteristics, we use Lagrange equation of the second kind made up for a solar battery kinetic energy and linkage simulation (hinged panels weight is attached), where we assume each link to be an absolutely rigid body. To determine the connections and efforts in cables, we use the equations d'Alembert. The study suggests an iterative method of accounting for rope synchronization systems elastic deformation.

Keywords: *mathematical model, rope disclosure system, multilink design, solar battery, deformation*

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