Tethered Solar Power Station Satellite

What is tethered SPS?

Ishimura and Higuchi (2008) studied the coupled phenomenon among attitude motion,tether vibration,and orbital motion by treating Tethered SPS as a tethered satellite system(two tip particles connected by a massless spring). Li et al. (2018) established a dynamic model of Tethered SPS by simplifying the solar panel as a rigid body.

Is tethered SPS a dynamic system?

A new dynamic model of Tethered SPS is proposed based on ANCF and the orbit-attitude-vibration coupled dynamic phenomena are studied. Simulation results revealed that the attitude of the system is unstable when the mass of the bus system is relatively small, because the attitude of the solar panel is in an unstable equilibrium point.

Are non-space-based power beams included in NASA's SBSP project?

Countries with non-space-based power beaming efforts are not included. The idea of SBSP is not new to NASA,which conducted feasibility studies first in the 1970s (NASA &DoE,1980) and again in the 1990s (Mankins,A fresh look at space solar power: New architectures,concepts and technologies,1997).

Which space systems have significant mass and solar panel area?

To provide context,consider two examples of space systems with significant mass and solar panel area: an aggregated mass,the International Space Station (ISS);and a distributed mass,a constellation of 4,000 Starlink v2.0 satellites4. The solar panel area is 11.5km2 for RD1 and 19km2 for RD2.

To collect additional solar energy during the hours of darkness and to overcome the limited Terrestrial solar power due to the diurnal day-night cycle, the concept of a Geostationary ...

Tethered Solar Power Satellite (Tethered-SPS) consisting of a large power generation/transmission panel and a bus system which are connected by tether wires has been ...

The technologies for the Solar Power Satellite (SPS) have been well studied on the ground and now it is highly required to make demonstration experiments in space as the next logical step. One of the ...

The concept Tethered-SPS is highly robust and potentially low cost. This paper presents a construction scenario for a new version of Tethered-SPS that is integrated by perfectly equivalent tethered units ...

"A new concept of solar power satellite: Tethered-SPS" Acta Astronautica 60 (2006) 153-165 and Pellegrino et al. "A lightweight space-based solar power generation and transmission satellite."

To collect solar energy in outer space, Tethered Collecting Solar Power Satellite Systems have been proposed by several authors in the last years. A geostationary orbit would be the ...

Tethered solar power satellite (Tethered-SPS) consisting of a large panel with a capability of power

generation/transmission and a bus system which are connected by multi-wires is proposed ...

In this paper, a dynamic model for long-term on-orbit operation of the tethered solar power satellite (Tethered-SPS) is established. Because the Tethered-SPS is a super-large and super ...

A new orbit-attitude-vibration coupled dynamic model of the tethered solar power satellite (Tethered SPS) is established based on absolute nodal coordinate formulation. The Hamilton"s ...

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