IAF SPACE POWER SYMPOSIUM (C3)
Space Power System for Ambitious Missions (4)

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SOLAR POWER SATELLITES FOR LUNAR EXPLORATION

Abstract

Solar power satellites have been investigated extensively over the past fifty years as a potential solution to meeting global energy demand sustainably. However, the construction of a commercial solar power satellite, while in principle technically feasible, remains a long term goal due to their high economic cost. At the same time, there is a need for the development of suitable energy generation technologies for lunar exploration and industries. The more manageable power requirements of these applications, in the kilowatt range, may make them nearer term goals for solar power satellites.

While preliminary analysis of such concepts has been carried out, showing their potential viability, further work can be done to optimise the chosen orbit, and different system components for a particular end user at a particular location on the Moon. Additional analysis is also necessary to understand the benefits such a system would have when compared to alternative advanced and conventional power sources. This paper assesses the performance of different solar power satellite systems for lunar exploration missions with different user requirements. The aim of this work is to investigate the technical viability of using solar power satellites as an energy service provider for lunar exploration missions.