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IAF SPACE POWER SYMPOSIUM (C3)
Solar Power Satellite (1)

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A PROPOSED SPS TECHNOLOGIES DEMONSTRATION MISSION IN SPACE

Abstract

Space power satellite (SPS) is a huge spacecraft capturing solar energy in space and to supply electric power to the electric grid on the ground. The SPS concept was proposed by Dr. Peter Glaser in 1968 and this year is the 50th anniversary. Due to the huge size, immense mass and high power of such a satellite system, there are many technical challenges which exist to realize it, even there is no a technology demonstration system developed so far. According to different SPS development roadmaps proposed by IAA, Japan and China, the technology demonstrations in different level, including component level, subsystem level and system level, need to be carried on in space. According to the proposed SSP roadmap by Chinese experts, the key technologies related to SSP need to be demonstrated in space step by step, including high power electric power generation, wireless power transmission, space super-large structure, assembly and control. As the first step, the high power electric generation and WPT demonstration mission is proposed in the paper. The mission will demonstrate high voltage power generation, kW MPT from LEO to ground and kW LPT from LEO to ground and LEO in space simultaneously by two spacecraft and validate the theoretical energy transmission and long distance beam control precision which will lay the foundation for the sequent missions.