

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

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SPACE SOLAR POWER CUBESAT TECH DEMO MISSION – AN OVERVIEW

Abstract

There is a fundamental issue with energy on Earth: the amount of renewable energy on the planet is insufficient to provide the quality of life enjoyed in developed nations to the rest of the world. Nuclear power has been shown to be unreliable in a few notable cases, and the resultant distrust has made it a non-viable option in the long run. Therefore, energy must be supplied to planet Earth from elsewhere, and our nearest and most immediate energy source is the Sun. Therefore, it is our goal to harness the Sun's energy where it is most powerful, directly in space via Space Solar Power (SSP) satellites. This is an established premise that has been unable to get off the ground due to urgency, economic constraints and feasibility. This work leverages the agility and accessibility of New Space approaches to provide power from space with nanosatellites in LEO. This paper focuses on the first step to prove the feasibility of the concept on collecting energy in space using a novel deployable structure and beaming energy down to Earth. The goal of the mission is to collect 100W of power on a CubeSat and carry out pointing operations with the large deployable structure. The mission is a joint venture between Deployables Cubed GmbH (D3) in Germany, who is responsible for the SSP payload and the California Polytechnic State University (CalPoly) in the US, who is responsible for the bus development and the mission (planning execution). The launch of the mission is currently planned for Fall 2021. The work will summarize the concept, the technology demonstration satellite design as well as the mission. It will conclude with an outlook on the next steps.