

Recent Accomplishments in Laser-Photovoltaic Wireless Power Transmission

Abstract

Wireless power transmission can be accomplished over long distances using laser power sources and photovoltaic receivers. Recent research at AMOS has improved our understanding of the use of this technology for practical applications. Research by NASA, Boeing, the University of Alabama-Huntsville, the University of Colorado, Harvey Mudd College, and the Naval Postgraduate School has tested various commercial lasers and photovoltaic receiver configurations. Lasers used in testing have included gaseous argon and krypton, solid-state diodes, and fiber optic sources, at wavelengths ranging from the visible to the near infra-red. A variety of Silicon and Gallium Arsenide photovoltaic have been tested with these sources. Safe operating procedures have been established, and initial tests have been conducted in the open air at AMOS facilities. This research is progressing toward longer distance ground demonstrations of the technology and practical near-term space demonstrations.

Author Biography

Mr. Fikes began his NASA career in January 1985 as an aerospace engineer in the Subsystems Design Division in the Preliminary Design Office of the Program Development Directorate. Mr. Fikes is currently a senior systems engineer in the Flight Projects Directorate's Advanced Projects Office. He accomplishes a significant role in the technical definition of advanced space system concepts for supporting future NASA space missions. Mr. Fikes is the contracting officer's technical representative (COTR) on the Space Solar Power (SSP) Technology Demonstration for Lunar Polar Applications activity. This activity is a contracted effort with Boeing North America to mature SSP technology applicable to a lunar polar mission through ground demonstrations. He has provided leadership in directing this broad and complex activity that advances the state-of-the-art in SSP technologies. Mr. Fikes holds a Bachelor of Science degree in Electrical Engineering from the University of Alabama Huntsville in Huntsville, Alabama.

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