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ADVANCING SMALL SATELLITE COMMUNICATIONS WITH EMERGING FREQUENCY BANDS AND MULTI-PANEL REFLECTARRAY ANTENNAS

Abstract

The demand for higher data volumes to be downloaded from small satellite constellations is driving the need for higher frequency bands like Ku (12-18 GHz), K (18-27 GHz), and Ka-band (27-40 GHz). However, these bands are still emerging technologies for small satellite constellations due to the types of antennas needed and the power requirements. German Orbital Systems GmbH is at the forefront of developing satellite missions that utilize these emerging technologies, and they are bringing their expertise to the consortium for the Deployable Mechanisms for Multi Flat-Panel Reflectarray Antennas for Small Satellites project, led by DCUBED. As a key partner in this project, German Orbital Systems GmbH is providing their expertise in satellite missions to support the consortium of companies. Alongside Celestial Space Technologies GmbH, Blackwave GmbH, and DcubeD, German Orbital Systems is combining their unique skills to design, manufacture, and test a multi-panel Ka-Band reflect array antenna for a 12U CubeSat. The project covers concept definition, analyses, breadboarding activities, as well as the design and fabrication of a mechanical engineering model that will undergo environmental testing and functional testing in representative conditions. German Orbital Systems' contribution to this project will bring the subsystem from TRL 3 to TRL 6, delivering a significant advancement in satellite telecommunications technology.