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LUNAR SUPPORT SERVICES – ENABLING NEW MISSION OPPORTUNITIES FOR SMALL
SATELLITES

Abstract

Surrey Satellite Technology Limited (SSTL), Goonhilly Earth Station (GES), and the European Space Agency (ESA), are engaged in a commercial partnership to deliver supporting services for lunar exploration. The partnership is developing a low cost, commercially developed, space and ground segment suite to form an integrated set of services supporting lunar exploration and utilisation over the coming decades. This focuses on three enabling services: 1) Transportation of payloads to lunar orbit, 2) Provision of communications data relay services, and 3) Delivery of navigation services. This will enable new missions and novel concepts for exploration, and will help to increase the utilisation and value derived from lunar exploration assets (orbiting or landed). One of the key services planned, is a Cubesat and Nanosat delivery service, both for international institutional customers and for commercial actors. The use of such small satellites for science and exploration of the Moon is of high interest around the World, but such missions often suffer from a lack of delta-V (energy) to reach lunar orbit, and the ability to communicate meaningfully over large distances back to Earth. The partnership aims to address these issues and offer an integrated service to customers, including transportation of the Cubesat directly to lunar orbit (something that other services such as those on the Space Launch System (SLS) do not currently offer), as well as provision of communications and navigation support to these missions via a local proximity relay node and a commercial deep space ground segment. The latter will also provide a software defined operations interface to the customer mission teams, allowing a flexible and easy way for data, telemetry, and telecommands to be sent to and from the Cubesats in lunar orbit. The paper outlines the proposed mission architecture of the partnership, the services offered, and presents several use-cases of potential lunar Cubesats, showing how the partnership can be an enabler for new low-cost lunar science and exploration missions.