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PLANNING OF OPERATIONS FOR UKUBE-1, THE UK'S FIRST CUBESAT

Abstract

The United Kingdom is planning to launch its first cubesat, UKube-1, in the second quarter of 2014. UKube-1 is a novel cubesat in that it has 6 payloads, including two demonstrating communications, with very different capabilities and demands on satellite resources such as power and communications. This means that planning the operation of the instruments is a far from trivial task if the most is to be extracted from what the mission has to offer. For example, images from the camera take several downlink sessions to reach the ground if the baseline VHF downlink is used, but go almost instantaneously if the S-band downlink payload is available. In addition, the power available from the spacecraft is insufficient to have all of the instruments on when there is a case for doing so, since there is an eclipse in every orbit. These factors mean that we must balance the need of the instrument providers to get the maximum return from their own instrument, with the mission requirement to exercise all the payloads, to demonstrate their use in the space environment, and to get some useful scientific and technical return from the mission.

The paper will describe the UKube-1 spacecraft and its payloads, the operational constraints that it is subject to, and the methods used to maximise the return from the mission. It should also describe some early results from the mission.