EPSC Abstracts,
Vol. 4, EPSC2009-562, 2009
European Planetary Science Congress,

Development of a CubeSat-based highly integrated science payload package suitable for future planetary missions

D. O. Kataria (1), A. Smith (1), P. Brown (2), T. Horbury (2), T. Vladimirova (3), C. Underwood (3), C. Carr (2), M. Dougherty (2), A. J. Coates (1), R. Bedington (1)

(1) Mullard Space Science Labortory, University College London, Holmbury St. Mary, Dorking, Surrey RH5 6NT, UK, (2) Blackett Laboratory, Imperial College London, Prince Consort Road, SW7 2BZ, UK, (3) Surrey Space Centre, Department of Electronic Engineering, University of Surrey, Guildford, UK, GU2 7XH, UK, (dok@mssl.ucl.ac.uk/ Fax: +44-1483-278312)

Abstract

Payload packages with shared electronics and a high level of integration significantly reduce mass and power. For CubeSat-based future science missions, in order to accommodate a complex payload suite and spacecraft subsystems required within the low level of resources available, such integration is crucial. We describe here a suite of highly miniaturised payloads under development in the UK which is proposed to be integrated into such a low resource package. The payloads, which include a magnetometer at Imperial College London, penetrating radiation instrumentation and reconfigurable system-on-a-chip at the Surrey Space Centre and a low energy plasma analyser at the Mullard Space Science Laboratory, University College London, will enable a number of science studies to be carried out in Low Earth Orbit with CubeSats. The integrated approach will optimise electronics sharing, e.g., power supplies, processing and control electronics, ideally with the payloads accommodated on a single board. In addition to CubeSats, the package developed will provide an attractive solution for future planetary missions. Moreover, we will include the possibility of flight demonstration at component level, showing how such demonstration might be accommodated within an integrated payload.