Geophysical Research Abstracts
Vol. 21, EGU2019-7932, 2019
EGU General Assembly 2019

A Long-Life Science Sensor Electronics for Atmospheric Remote Sensing Imaging from CubeSats in Low-Earth-Orbits

Tom Neubert (1), Heinz Rongen (1), Egon Zimmermann (1), Martin Kaufmann (2), Friedhelm Olschewski (3), Stefan van Waasen (1,4)

(1) Central Institute of Engineering, Electronics and Analytics - Electronic Systems (ZEA-2), Forschungszentrum Jülich, Jülich, Germany , (2) Institute of Energy and Climate Research (IEK-7), Forschungszentrum Jülich, Jülich, Germany , (3) Institute for Atmospheric and Environmental Research, University of Wuppertal, Wuppertal, Germany, (4) Faculty of Engineering, Communication Systems (NTS), University of Duisburg-Essen, Duisburg, Germany

CubeSats have become very popular in the past decades which yields to a continuously increasing number of developers in the academic field. For all science missions, customized payload electronics have to be developed, depending on measurement tasks and requirements. Especially for the deployment of more complex remote sensing payloads, state-of-the-art performance is needed to provide operational control and specific data processing of the image sensors. With a highly integrated System on Module (SoM) architecture low resource requirements for both, power and mass, but moderate to high processing power capabilities are available. The major advantages are flexibility, (re)programmability, modularity and module re-use in respect to lower development time and costs. However, it is a challenge to make this module suitable to implement it into space environment. With an efficient approach a radiation tolerant characteristics will be achieved by modelling the radiation environment, estimating the hazards at module level and reducing it to acceptable risks with necessary measures of mitigation techniques. This approach results into a sensor electronics which combines hardware and software redundancies to assure system availability and reliability for long life science missions in Low-Earth-Orbits (LEO). A dual imager electronics design is presented which uses module architecture based on reconfigurable hardware with a processing unit as high integrated commercial-off-the-shelf (COTS) components integrated in a 6U CubeSat. First qualification and acceptance tests with the electronics will be shown.