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RATE CONTROL SYSTEM FOR SOUNDING ROCKETS

Abstract

DLR/Moraba has a long history in designing Rate Control Systems (RCS) which have been flown for several programs for research in weightlessness in Europe and Brazil. They had been used in different European G programs like MAXUS, MASER and TEXUS. Moraba has now developed a RCS system for 14 " payloads. This RCS system uses a standard interface and can be easily joined to a REXUS service module. This combination (RCS and REXUS service system) come into operation for the MAPHEUS maiden flight. MAPHEUS (Materialphysikalisches Experiment unter Schwerelosigkeit) is an internal project of DLR. The payload for this project, including the service systems and 4 experiments, will fly on a Nike/improved Orion 2 stage motor which brings the payload to an altitude of about 150 km, providing a period of weightlessness for more than 180 seconds. To achieve conditions of weightlessness above the atmosphere a RCS system is indispensable. The aim of the RCS is to reduce the rates of the payload significantly above the atmosphere in order to minimize the centrifugal accelerations to a level beneath at least of $1*10-5$ g. This article describes the principle of a rate control system. It provides an insight into the interaction between the control loop, payload and actuators.