SPACE OPERATIONS SYMPOSIUM (B6)
Human Spaceflight Operations (1)

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CADMOS : 20 YEARS OF MICROGRAVITY OPERATIONS

Abstract

CADMOS (Centre d'Aide au Développement des activités en Micro-pesanteur et des Opérations Spatiales) is a CNES (Centre National d'Etudes Spatiales) structure which helps scientists to prepare, develop and operate a large variety of experiments which require microgravity environment, on-board the International Space Station but also on the Airbus-0g or automatic capsules.

CADMOS was officially created in 1993 in order to support all French manned flights performed on-board MIR station or Shuttle spacecraft. Thanks to its knowledge of manned flights acquired since the beginning of the 80's with the PVH mission, CADMOS is recognized for its operational and scientific expertise.

In 1998, ESA decided to adopt a decentralized infrastructure for the operation of European payloads on board the ISS, based on the concept of Users Support Operational Centres (USOCs). USOCs are based on already existing national user centres. CADMOS, as French USOC selected by the ESA, is responsible for the operations of major European ISS instruments: the European Physiology Modules (EPM), the Muscle Atrophy Research and Exercise System (MARES) and the Atomic Clock Ensemble in Space (ACES).

In addition to the payloads developed by ESA, CADMOS has kept its role of national center to develop and operate French experiments either directly developed by CNES and performed on-board the ISS as part of bilateral collaboration programs (DECLIC with NASA, or CARDIOMED with Russia), or independently.

The main scientific fields covered by CADMOS during manned space missions are physiology, biology, neuroscience, fluid physic, material science, electronic components and structure mechanics as well.

During the preparation of experiments, CADMOS's role consists mainly in managing interfaces with the other operational teams (with respect to safety and on-board resources), in writing the operational products, in delivering the experiment before launch and, for physiology protocol, in supporting baseline data collection. Once the experiment is in orbit, CADMOS is responsible for monitoring operations on the ISS. Engineers send commands to the instruments and receive experiment data in real time. This activity is done in the Control Room, which has been especially fitted out in CNES premises. At least, CADMOS is responsible for the whole data processing chain, including acquisition, archiving and distribution to scientists.

Celebrating 20 years of successful operations at CADMOS, the paper will

- show what has been done during those two decades

- give an overview of the ongoing operations
- anticipate the future showing CADMOS plans for the upcoming years