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SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
On Track - Undergraduate Space Education (3)

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HANDS-ON ACTIVITY ON SPACE SYSTEMS AT SAPIENZA - UNIVERSITY OF ROME

Abstract

Designing, realizing and testing real space projects plays a fundamental role in the training of young aerospace engineers. Sapienza Space Systems and Space Surveillance Laboratory (S5Lab) of Sapienza – University of Rome carries out several training activities, seizing the opportunities in order to provide the students a real "hands-on" education. The main research activities focus on satellite systems, including on-board systems and sub-systems design, testing and development, and space surveillance systems, including optical observation systems design, development and related operations, data analysis, orbiting objects orbital determination and active debris removal systems. "Space Systems Laboratory course" has been held during the third year of the Bachelor's Degree in Aerospace Engineering at Sapienza – University of Rome by using the S5Lab facilities since February 2015. Besides theoretical basis, the main goal of this course is to provide students with the capability of facing real space projects. In particular, during the activities performed between February and May 2015, three student teams have been designed and developed different projects: a thermal regulation system for the low-vacuum chamber, a real-time detection system to recognize the position of a quadcopter and evaluate the optimal trajectory for the prefixed mission; a custom control system for the optical observation of satellites through telescope. The results and the methodology used to carry out these experiments will be addressed in the paper. In the framework of the second semester of the 2015-16 academic year, the Laboratory of Space Systems activity will be focused on the design, the development and the testing of three CanSats, a prototype of small satellite payload, integrated within the volume and shape of a soft drink can. In the paper technical details and results of the above mentioned activities will be described, analysing the teams methodology to reach their goals and the skills acquired throughout the whole design process. The educational value of "hands-on" activity in the space field will be discussed and more details about the student feedbacks will be given.