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A UNIVERSITY IN SPACE – A CASE STUDY

Abstract

Pico-satellites were in academic environments considered as very motivating hands-on examples to teach students systems engineering. After return from a sabbatical with Prof. Bob Twiggs at Stanford University in 2002, a first pico-satellite activity related to communication experiments was initiated, in particular on optimizing protocol parameters for “internet in space”. This attracted highly qualified international students and resulted in the launch of the CubeSat UWE-1 (University Würzburgs Experimental satellite) in October 2005 as first German pico-satellite. Subsequently a roadmap for the next pico-satellite missions to develop the relevant technologies leading to a formation of pico-satellites was set up. This way, for all incoming students there is always an opportunity to participate in a UWE-mission. Together with European partner universities the international program “SpaceMaster” followed and was supported by the European Unions Erasmus Mundus framework. Another spin-off was the foundation of the research institute “Center for Telematics” outside the University to provide also services related to networked satellite systems. Thus pico-satellites enabled within 10 years to start several curricula offering attractive career opportunities for students, and supported participation in space system standardization as well as international university cooperation activities (UNISEC Europe, SUAC). The very small satellites exhibit due shorter implementation cycles a very high innovation potential in order to advance spacecraft system design.