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The Phoenix GPS Receiver for Rocket and Satellite Applications: An Example for the Successful Utilization of COTS Technology in Space Projects

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Abstract:

This talk aims to provide a practical example of the successful application of an entirely COTS-based GPS receiver in various space projects such as sounding rocket flights and LEO satellites missions. Almost any Earth-orbiting satellite mission planned and realized during the last two decades has, at any point, considered to employ a GNSS receiver as part of the satellite. However, for the majority of these projects, a fully space-qualified GNSS receiver is out of reach due to the extremely high costs typically associated with such hardware. For projects with a more limited budget the use of a COTS-based version of the desired device is typically the only viable alternative. Driven by this motivation, DLR's space flight technology group has commenced to explore, develop and test COTS-based GPS sensors about 20 years ago. As an outcome of this work, among others, the Phoenix GPS receiver for space applications has been developed, tested and finally made available to numerous small- and mid-scale space projects. In this talk, the Phoenix GPS receiver will be introduced in more detail. An overview about the conducted space qualification program and the so far gathered flight heritage of the sensor will be provided.

Short Bio:

Markus Markgraf is a senior research engineer in the GNSS Technology and Navigation Group at DLR/GSOC. He started working at DLR in 2000 after graduating as Dipl.-Ing. (FH) for Electrical Engineering and Communication Technology. His research activities comprise GNSS receiver technology for satellites and sounding rockets, scientific applications of GNSS and mission support and analysis. He was the key engineer for the Navigation and Occultation Experiment (NOX) on TET-1 during the design and implementation phase. Currently he is responsible for the development of the GNSS sub-systems for the re-entry and reusable launcher missions CALLISTO and ReFEX.



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