

IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
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SATCOM 2025 – THE NEAR FUTURE OF SATELLITE COMMUNICATIONS IN GERMANY

Abstract

Our digital world is developing into a global village where everything is connected to everything else in ever increasing varieties. Satellite communications has to provide its key role in the hybrid networks of the future, also in Germany. Hence, the German Aerospace Center (DLR) has specified the mission definition study SatCom 2025. This paper highlights the methodology and the results of this project, contracted to a team under lead of OHB System AG. The main aim is to define a potential solution for a geostationary space based communication system that includes technological innovations and improved communications methodology. Based on current achievements in the relevant research and industrial environment, the mission will foster the capabilities to develop and manufacture such complex space based systems in Germany. Special attention is given to the fact, that the increasing digitalization of our society creates a strong dependence on the availability of communication means. Even in densely populated and comparably well connected areas local events can disrupt the existing terrestrial communication networks. Satellite solutions can immediately bridge gaps and provide capacity especially for critical applications demanding a high degree of security for transmissions and integrity of communications. Against this backdrop, the SatCom 2025 mission is covering public and governmental aspects. The project covers key technologies needed to sustain and extend the know-how in Germany. It targets at increasing the cost efficiency, the robustness, and also tackles aspects of miniaturization of components in the field of on board processing in regenerative payloads with beam forming capability antennas. The building blocks are looking into more flexibility in space and ground segment and covers current trends like high throughput systems and higher frequency usage in Q-, V- and W-Band. The improvement of optical communications is covered, and also cutting edge transmission schemes like MIMO and aggressive frequency reuse are considered. The proposed mission is making use of OHB's SmallGEO product line and carries three payload types. The first being a broadband system for users in Ka-Band, gateways in Q/V-band and an optional optical feeder link. Additionally, it provides a broadcast element with feeder link in V-Band and an experimental W-Band payload to investigate signal propagation and atmospheric compensation effects for this spectrum range.