Airplanes have similar requirements and restrictions as launchers. The use of UWB for in-airplane systems is addressed in [6], [7], [8], [9], and [10], to give some examples. As opposed to expensive channel sounding [10], our work employs off-the-shelf transceivers. Condition monitoring for mechanical parts of an airplane is investigated in [11] and [12].

As an alternative wireless technology, infrared communications is considered to be safe for the integrated aviation electronics and thus it is commonly used. An infrared system for broadcasting sensor readings in an Ariane VEB is studied in [2]. A real-time wireless sensor network is proposed in [4], taking the VEB environment into account and discussing the use of spatial diversity. Further work on infrared communications in this context — e.g., on bit error rates, diversity, and energy efficiency — can be found in [2], [3], [13], and [14].

Most related work is for applications with short payload packets and low data rates (e.g., for temperature, humidity, or pressure sensors). In contrast, our work employs a sensor network with data rates of several Mbps and payload sizes of 1023 bytes.

V. Conclusions

We implemented and deployed a testbed for high-speed UWB communication inside a space launch vehicle and evaluated the uplink from sensor nodes to APs using state-of-the-art commercial transceivers. The results show that the received power significantly varies over time but is still wel[illegible] above the sensitivity level for all studied node locations w[illegible] a single AP. This offers an indication that UWB is a s[illegible]e technology in this environment, although further experime[illegible] studies are necessary to assess the reliability and quality o[illegible] service demands of space applications.

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