Master Thesis

Design and development of an antenna system for high data rate RX/TX operations on small satellite systems

Designing and developing an antenna system for RX/TX (receive/transmit) operations on small satellite systems is a crucial task for enabling high-data-rate communication in compact platforms like CubeSats. The e.g. X-band offers advantages such as reduced antenna size and increased bandwidth, making it ideal for small satellites with limited space and mass.

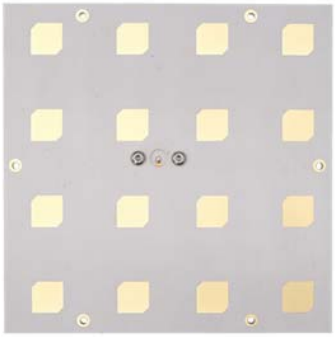
However, these systems face several challenges: ensuring reliable performance despite the satellite's constrained power budget, maintaining precise pointing accuracy for narrow-beam antennas, and mitigating thermal and mechanical stresses during launch and in orbit. Additionally, integrating the antenna with other subsystems without causing electromagnetic interference requires careful engineering. Overcoming these hurdles is essential to support advanced mission capabilities like Earth observation and inter-satellite links.

Your Tasks

- Review of state-of-the-art antenna systems used in small satellites
- Identification of challenges and problems faced, especially for small satellite platforms
- Comparison and frequency decision
- Analysis and design of possible patch antenna arrays to achieve high antenna gains
- Prototype manufacturing, test and validation under supervision

Your Profile

- Completed bachelor's degree in electrical engineering, electronics or a related field
- Interest in space activities and communications engineering
- Experience in hardware design and layouting
- Willingness to actively engage in research work
- Strong problem-solving skills and critical thinking
- Team-oriented and organised



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