

ABSTRACT

CubeSat has gained a lot of attention from the aerospace industry due to its low cost, easy assembly process, light weight, and speed of launch. Government agencies, space agencies, and the private sector are all developing CubeSats to accommodate various applications and missions. The main function of CubeSat is not only for space-earth communication links, but also includes inter-space communication. Tel-U together with Telkomsat developed a CubeSat that is used to help ship crews monitor and enable maritime authorities to track and monitor ship movements. CubeSat requires an antenna to communicate with ground stations. Antenna design for small satellites such as CubeSat is a challenge for researchers, especially at UHF frequencies. The small size of CubeSat (10 cm x 10 cm x 10 cm) imposes several constraints on antenna design. Extreme packing ratios and complex placement mechanisms must be used to place UHF antennas on the CubeSat platform. To overcome these obstacles, this research aims to develop a deployable antenna system integrated with the CubeSat. The integration of a deployable antenna into a low orbit (LEO) CubeSat with an altitude of (300-400 km) enables the CubeSat to communicate with ground stations.

This research focuses on developing a deployable antenna system that enables a CubeSat to communicate with a ground station. The system is designed to be integrated into a small CubeSat (10 cm x 10 cm x 10 cm). Testing and validation are conducted to ensure that the deployable antenna system can function optimally when integrated with the CubeSat.

The results of this study show that the developed deployable antenna system performs well in receiving AIS signals. In addition, the heating system can work optimally. Further research can be focused on improving the efficiency and adaptability of the system for various operational conditions.

Keywords: Antenna, Cubesat, UHF Frequency, AIS, Space-earth communication