

Description of the Research Project

The Experimental Radio Service requested for this research project is to be used to provide essential communications to a new satellite (TSat) that will be launched in early 2014. Due to the fact that the satellite is new, no alternative means of communications are available.

1. A description of the nature of the research project being conducted.

The research project is an in-flight demonstration to test the micro newton thrusters technology developed at MIT by Prof. Lozano's research group. The technology will be game-changing since it will provide CubeSats with a new and real capability for sustained orbital maneuvering, precise formation flights, and precision pointing. The spacecraft that will be used to test the thrusters is a 1 Unit CubeSat. The CubeSat will contain: the micro newton thrusters and their control electronics, CubeSat standard avionics and power system (including electrical power unit, batteries, and solar panels equipped with magnetorquer, gyroscope and temperature sensors), and UHF communication equipment. The ground system is composed of a UHF station developed at MIT.

2. A showing that communications facilities are necessary for the research project involved.

To test the micro newton thrusters technology in space, a CubeSat needs to be launched and data need to be transmitted to the Earth. Hence, a communication facility on the CubeSat is necessary for the research project.

3. A showing that existing communications facilities are inadequate or unavailable.

Due to the fact that the research project requires to fabricate and to launch a completely new satellite, no existing communication facilities are available.